



# Towards a green infrastructure system for Santiago de Chile

The pilot Santiago+ Green infrastructure (Stgo+) Plan started in 2018 led by the University of Chile, the Regional Ministerial Secretariat of Housing and other strategic partners. Through a broad participatory process, a plan is created which synthesizes ideas and initiatives into a vision to transform Santiago into a greener, fairer, more equitable and resilient city.



**553** ha  
of existing green spaces

**42** Actors  
17 public  
16 civil society  
6 academic  
3 private

### Nature based Solutions benefits



### Challenges

Explaining Nature Based Solutions to all stakeholders

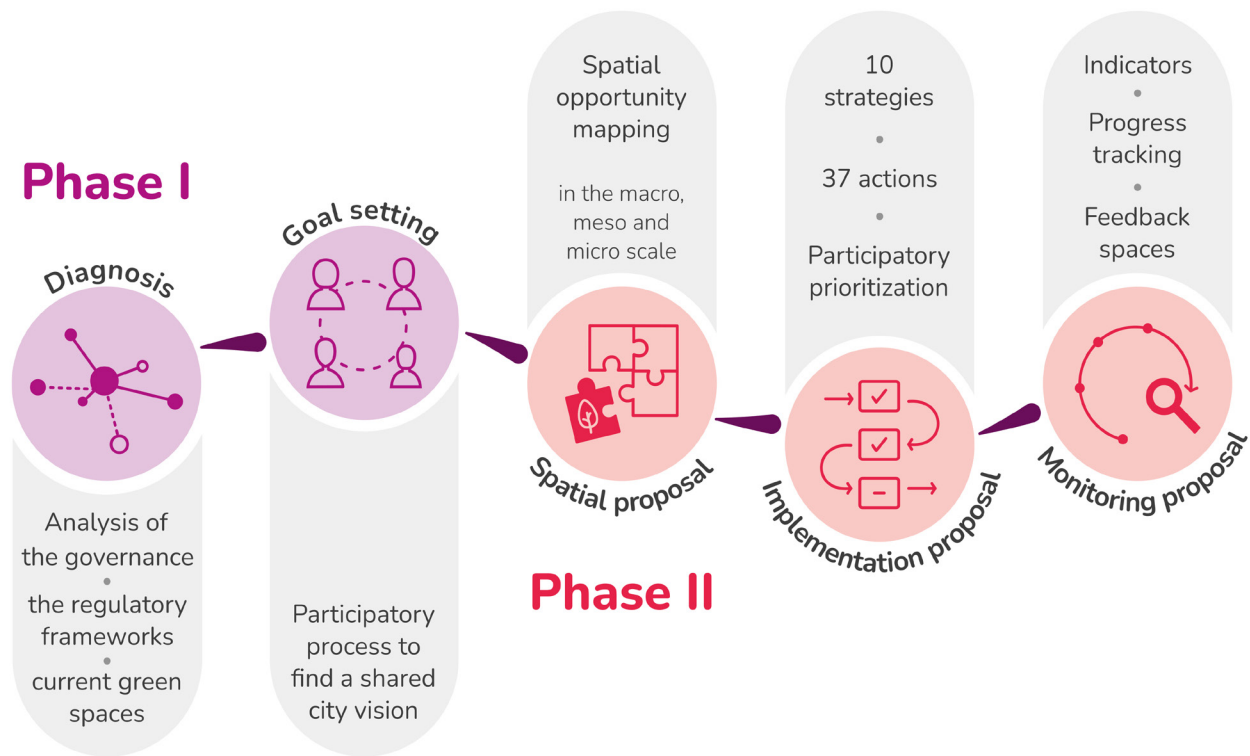
Fragmented governance setting

Outdated planning instruments on green spaces

### Background

With around 8 million inhabitants, Santiago is the political and administrative center of Chile and faces important challenges: strong socio-spatial segregation, unequal distribution and access to green areas, natural hazards, air pollution, and loss of biodiversity. Furthermore, Santiago is extremely vulnerable to climate change, mainly by temperature increase, heat waves and drought. A green infrastructure system could play a key role in mitigating these problems. However, efforts of the many institutional public and private initiatives around the design, implementation and management of urban greenery are fragmented and isolated. The sustained increase of citizen initiatives around nature demonstrates a growing community interest in a greener city and emphasizes the need for greater coordination and strategic vision.

Photos by Santiago CONEXUS Life-Lab



### The Santiago Approach

The development of the Santiago+ Green Infrastructure Plan began in 2018. The plan was designed in five stages based on the green infrastructure methodology by Benedict and McMahon (2006) and Firehock (2015). In the first stages, the plan encompassed the formation of a **Technical Committee** to lead the process and working groups including public and private actors, academia, and civil society. In the implementation stage, the **Santiago Life-Lab** and an **Executive Committee** worked collaboratively to promote the plan.

#### Diagnosis

Using a network analysis, the team analyzed the relationships between actors and the actors' current and potential influence on the green infrastructure

system implementation. Then the city's green spaces were inventoried, by compiling geospatial information from territorial planning instruments and analyzing satellite imagery. These green spaces were classified into typologies and sub-typologies based on international literature and local physical characteristics.

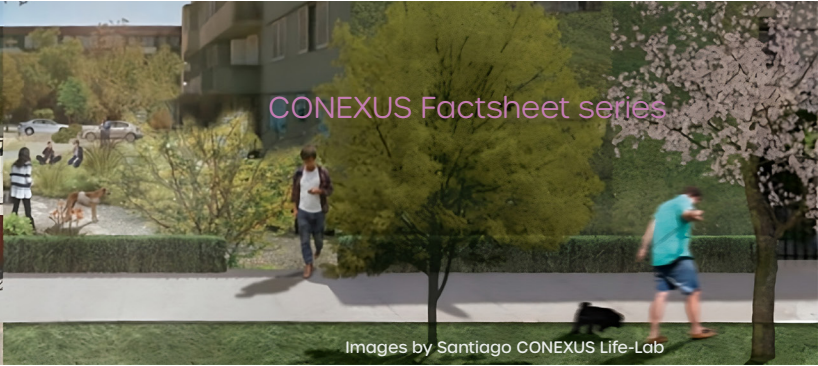
#### Vision and objectives of the Stgo+ plan

All stakeholders shared the vision for Santiago to become a more integrated and equitable city, while emphasis was also placed on making the city more resilient and healthier.

Based on the above, two strategic objectives were outlined:

1. To improve the social and spatial integration of the city.
2. To contribute to the city's climate change adaptation.





Images by Santiago CONEXUS Life-Lab

### Spatial proposal

At the macro-scale, the Life-Lab analyzed the natural context and its relationship with the city. Through participatory prioritization in collective mapping sessions, the most relevant current and potential green spaces were identified, such as metropolitan parks, the Andean foothills and the Mapocho River.

These main green spaces at the macro-scale defined the relation and the borders of different areas at the meso-scale. On the meso-scale, the Plan proposed zoning Santiago in 11 areas, according to their geographic and demographic characteristics, such as socio-economic groups, green spaces types, and natural landmarks. The needs and the more urgent interventions were distinguished, based on a comparative analysis of these areas.

For the development of micro-scale proposals, the team selected the study area with the lowest degree of green spaces within Santiago: the municipalities of Pedro Aguirre Cerda and Lo Espejo. Both areas have a high population density and a green space availability of 4.7 m<sup>2</sup>/inhabitant, well below the 10 m<sup>2</sup>/inhabitant required by national standards. The team identified 68.03 ha with potential to integrate in the green infrastructure system, including green spaces, brownfield sites, power lines and urban equipment areas.

### Implementation proposal

Through a participatory workshop, actors prioritized a set of strategies and evaluated more than 50 actions based on their

*The design and implementation of the Stgo+ Green Infrastructure Plan is an opportunity to articulate and channel dispersed collective efforts.*



pertinence, relevance, feasibility, and adaptability to the local context. The selected actions comprised crosscutting work, with a strong emphasis on regulatory, governance, education, and institutional aspects. In total, ten strategies and 37 actions were defined to implement through the Stgo+ Plan.

The implementation stage is planned to start by the end of 2023, when an Executive Committee, composed of public institutions, is formed, which is expected to have a strong influence on the planning and management of green infrastructure in Santiago.

### Monitoring and evaluation proposal

The last stage of the plan comprises of the monitoring of the implementation of each strategy through defined actions. A set of indicators will be used to monitor each action and evaluate the progress of their implementation. Feedback spaces are being organized to promote continuous learning and adapt the Stgo+ Plan to the changes in the city and new governance settings.

### Related Projects

 Plan Verde Coronel 2050. Bío Bío, Chile  
<https://tinyurl.com/Coronel5050>

 Borde Fluvial. Valdivia, Chile  
<https://tinyurl.com/BordeFluvialValdivia>

 Plan Director Bio 2030. Medellín, Colombia  
<https://tinyurl.com/DirectorBio2030>



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### References

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BENEDICT, M. A., & MCMAHON, E. T. (2012). Green infrastructure: linking landscapes and communities. Island press.

CONSEJO NACIONAL DE DESARROLLO URBANO (2018). Propuesta de sistema de indicadores y estándares de desarrollo urbano.

REED et al. (2009). Who's in and why? A typology of stakeholder analysis methods for natural resource management. Journal of environmental management, 90(5), 1933-1949.

### Key messages



1. Start the process with introducing new ideas and concepts despite the costs in time and resources.
2. A participatory design process enables dialogue and cooperation between stakeholders and government institutions.
3. Plans like Stgo+ promote cultural, institutional and legal changes, which can meet strong resistance initially.
4. Formalizing strategic, cross-sectoral, and multi-scale approaches in plans is needed in large cities, like Santiago.



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### City Partners

