“Initiatives to promote the development of underground spaces in Chile”
El Consejo de Políticas de Infraestructura, (CPI), was created with the firm intention of reinstating public infrastructure as a key issue on the country's political agenda, which, in addition to diagnosing the situation, formulates proposals, identifies priorities and monitors progress of government policies.

https://www.infraestructurapublica.cl

Comité de Túneles y Espacios Subterráneos de Chile, (CTES), is the official representative of the International Tunnel Association (ITA-AITES) and has set as part of its mission: To promote the development of the tunnels and underground spaces industry in Chile, linking all interest groups.

https://ctes.cl

El Comité de Obras de Infraestructura Pública, (COIP), is part of the Chilean Chamber of Construction, whose mission is to improve the quality of life of people committed to the sustainable development of the industry.

https://www.cchc.cl

La Asociación de Oficinas de Arquitectos de Chile, (AOA), is a non-profit organization that was born in 1998 and is made up of more than 180 national architect offices, responsible for an important part of the country’s architecture projects.

https://www.aoa.cl

Secretaría Ejecutiva:
La Corporación de Desarrollo Tecnológico, (CDT).

https://www.cdt.cl

La Corporación de Desarrollo Tecnológico, (CDT).
Objective

Chilean Board for underground space

“Promote and encourage the use of underground space, its virtues and potentialities, as an alternative for quality of life and urban development”
Initiatives
Board for the underground space

1. Georeferenced survey of underground projects cases
2. Diagnosis of technical and regulatory gaps for the development of underground space
3. Webinar and Congress of the Underground Space
4. Degree work program with the academic world
5. Proposals to public authorities
6. Visits to existing underground spaces ("Technological Mission")
7. Publications and dissemination in mass media
8. Underground Architecture Competition

DEVELOPED IN 2020
BOOST 2021
ACTIVATE IN 2021
2023
Initiatives developed in 2020
Cadastre of underground spaces in Chile
Methodology

BAUDATA PLATFORM

WEB Pilot create tab fields
Design tab and fields
Upload web cases table validation
Piloting the web platform

Team conformation and work proposal
Platform survey and definition of fields to be investigated
Validation of the pilot by the board
Survey of cases and normalize the fields
Identification of actors and population of data from the files
Initiatives developed in 2020
Cadastre of underground spaces in Chile
There are 3 categories of basic information display called:

1. “Fundamental fields”.
2. “Complementary fields”.
3. "Annexes”.

With the information we raise indicators on the development of these spaces.
Preliminary indicators
Cadastre of underground spaces in Chile

10
International underground spaces

114
Underground spaces in Chile

20
Underground spaces in regions

Worship and culture
Typology of predominant use

PROJECT NAME | COUNTRY
---|---
Bahnhof data Center | SUECIA
Colon Market | ESPAÑA
Louvre Museum | FRANCIA
Alboraya Palmaret Station | ESPAÑA
Auditorium in San Lorenzo de el Escorial | ESPAÑA
Caixaforum Madrid | ESPAÑA
Agbar Tower | ESPAÑA
Kursaal Auditorium | ESPAÑA
L. Bocconi University | ITALIA
Porsche Museum | ALEMANIA
Preliminary indicators
Cadastre of underground spaces in Chile

Underground spaces by region

Projects according to use

- **Region Metropolitana**: 29.6%
- **Region de Valparaíso**: 53.5%
- **Región Libertador Bernardo O’Higgins**: 16.9%

REGION OF ANTOFAGASTA (3)
REGION OF LOS RIOS (3)
REGION OF MAGALLANES (2)
REGION OF VALPARAISO (6)
REGION OF BIO BIO (1)
REGION LIBERTADOR BERNARDO O’HIGGINS (5)

Underground spaces in regions

N° cases: 104
N° cases: 71
Preliminary indicators
Cadastre of underground spaces in Chile

According to type of project

- N° cases: 87
- 87.4% new
- 12.6% rehabilitated

Financing type

- N° cases: 20
- 65% private
- 12.6% Public
- 12.6% Consent
Just a few examples of emblematic cases
Cadastre of underground spaces in Chile

Cultural Center Palacio La Moneda

- REGION: Metropolitana
- COMMUNE: Santiago
- ARCHITECT: Cristián Undurraga
- DESTINATION: Worship and culture
Just a few examples of emblematic cases
Cadastre of underground spaces in Chile

BOULEVARD PLAZA ÑUÑOA

- REGION: Metropolitana
- COMMUNE: Ñuñoa
- DESTINATION: Comercial
- LEVELS: 4
Just a few examples of emblematic cases
Cadastre of underground spaces in Chile

PROJECT CorpArtes
- REGION: Metropolitana
- COMMUNE: Las condes
- ARCHITECT: Renzo Zecchetto Architects
- DESTINATION: Worship and culture
Just a few examples of emblematic cases

Cadastre of underground spaces in Chile

MINING CENTER ANDRÓNICO LUKSIC

- REGION: Metropolitana
- COMMUNE: Macul
- DESTINATION: Education
- LEVELS: 2
The table for the Underground Space, defines that it is important to be able to raise impressions of the different actors related to the planning, design and construction of these underground spaces, with the final purpose of having a multidisciplinary perspective. The key user focuses:
### Initiatives developed in 2020

Diagnosis of technical and regulatory gaps for the development of underground space

<table>
<thead>
<tr>
<th>conception</th>
<th>planning</th>
<th>design</th>
<th>building</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Academic</th>
<th>Contractors</th>
<th>architects</th>
<th>engineers</th>
<th>builders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural and diffusion</td>
<td>Cultural and diffusion</td>
<td>Cultural and diffusion</td>
<td>Cultural and diffusion</td>
<td>Cultural and diffusion</td>
</tr>
<tr>
<td>Human capital management and specialization</td>
<td>Management and financing</td>
<td>Administrative management and financing</td>
<td>Management</td>
<td>Administrative management and planning</td>
</tr>
<tr>
<td>Normative</td>
<td>regulations and incentives for development</td>
<td>Normative</td>
<td>Normative</td>
<td>Normative</td>
</tr>
<tr>
<td>Integration of multidisciplinary views</td>
<td>Sustainable development impact</td>
<td>Sustainable development impact</td>
<td>Sustainable development impact</td>
<td>Service providers and machinery</td>
</tr>
</tbody>
</table>

**Difficulties:**
- Financial
- Geotechnical conditions
- Sustainable development impact
- Service providers and machinery

**Integration:**
- Academic
- Contractors
- Architects
- Engineers
- Builders

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"There are no minimum standards as part of the regulations, each designer bears full responsibility."

- Engineer-

"As for the regulations, a lot has been done but in a very fragmented way, what is missing here is an overview from the authorities."

- Architect-

"The success of the underground spaces depends on the demand of the users, I consider it necessary to establish a synergy between the subway stations and the commercial spaces."

- Engineer-
Relationship between national gaps with challenges mentioned by the ita-itacus

"The real challenge is in developing countries, where resources are scarce and where there are cities growing faster. We need really brilliant planning to solve those problems."

Harvey Parker,
Ex presidente de ITA de los Estados Unidos.

The problem lies in the need to be efficient and effective during the development of the life cycle of a project, where the role played by each professional must be based on cooperation and collaboration between the different actors involved, as well as the professionals who participate in the planning of cities in the future.

Han Admiraal
Presidente de ITACUS

"Engineers come up with robust and technologically feasible solutions, while planners are good at summarizing the overall concept, as well as analyzing and showing the broader benefits."

Antonia Cornaro –
Expert Underground Space at Amberg Engineering & ITACUS Co-chair.
Initiatives developed in 2020
Diagnosis of technical and regulatory gaps for the development of underground space

- Gaps and regulations in underground spaces.
- Document of conclusions and proposals.
- Research and awareness of E.S in the academy
- Survey of studies, thesis, reports on E.S
- Publication of "papers" from the academy
- Analysis of the indicators of the cadastre
- Publication "Market and development of the E.S"

Planning

Stage 1: Group formation
Stage 2: Development
Stage 3: Dissemination

Jan-Feb-Mar
Apr May Jun
Jul Aug Sep Oct
Nov Dec

Sectoral proposal for an underground Chile
**Working plan 2021**

Board for the underground space

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**DEVELOPED IN 2020**

**BOOST 2021**

**ACTIVATE IN 2021**

**2022**

www.espaciosubterraneo.cl
1. Launch and disseminate the "Cadastre of Underground Spaces".

2. Generate publication linked to the main consolidated indicators (KPIs) that arise from the cadastre.

3. Present the Cadastre to relevant stakeholders: public authorities, trade associations and academic entities.

4. Have a team that specializes in searching for information.

Incorporate LATAM cases and international cases from other continents.

www.espaciosubterráneo.cl
strategic vision

"We seek to promote development in the subsoil, promoting good practices and collaborative processes among those who plan, develop, build and inhabit these spaces, with an integrating perspective towards the community, its environment and the authorities."

How do we visualize this underground development?

- Integrate, communicate and sensitize communities. Relationship with the community, the impact of the constructive method.
- Promote urban connectivity and connection to public spaces.
- Optimize the release and efficient use of urban land, together with a resource distribution network and access to facilities.
- Align with the political pillars of development.
- Legal bodies that promote new propositional regulations that include certain economic incentives.
- Promote the rehabilitation and rescue of spaces. Integration of underground spaces to existing ones.
- They are spaces for economic and social development that generate a better quality of life for citizens.
First semester 2021: 2 new similar activities.

Second semester 2021: Hold the "Underground Space Congress", as an international activity, with the participation of important national and international speakers, from the public and private spheres.
Working plan 2021
Board for the underground space

7 Publications and dissemination in mass media

Newsletter
Publications and dissemination in mass media
Working plan 2021
Board for the underground space

BUSCATAMUS impulsar el desarrollo urbano en el subsuelo,
promoviendo mejores prácticas para el diseño y construcción de obras subterráneas.

www.espaciosubterraneo.cl
Why not be partners?

- Work together to identify international cases and raise global indicators.
- Invites you to participate in our webinars and working groups.

How Cities are going to fight ...

- overcrowding and land scarcity
- climate change and be resilient
- urban planning and adaptation

>> USEFUL TOOL TO UNDERSTAND
>> HOW THE UNDERGROUND HAS BEEN DEVELOPED.
“Initiatives to promote the development of underground spaces in Chile”

Ximena Finschi
xfinschi@cdt.cl
Project Coordinator
Project and Services Management
Corporación de Desarrollo Tecnológico, CDT
Cámara Chilena de la Construcción