



CERN

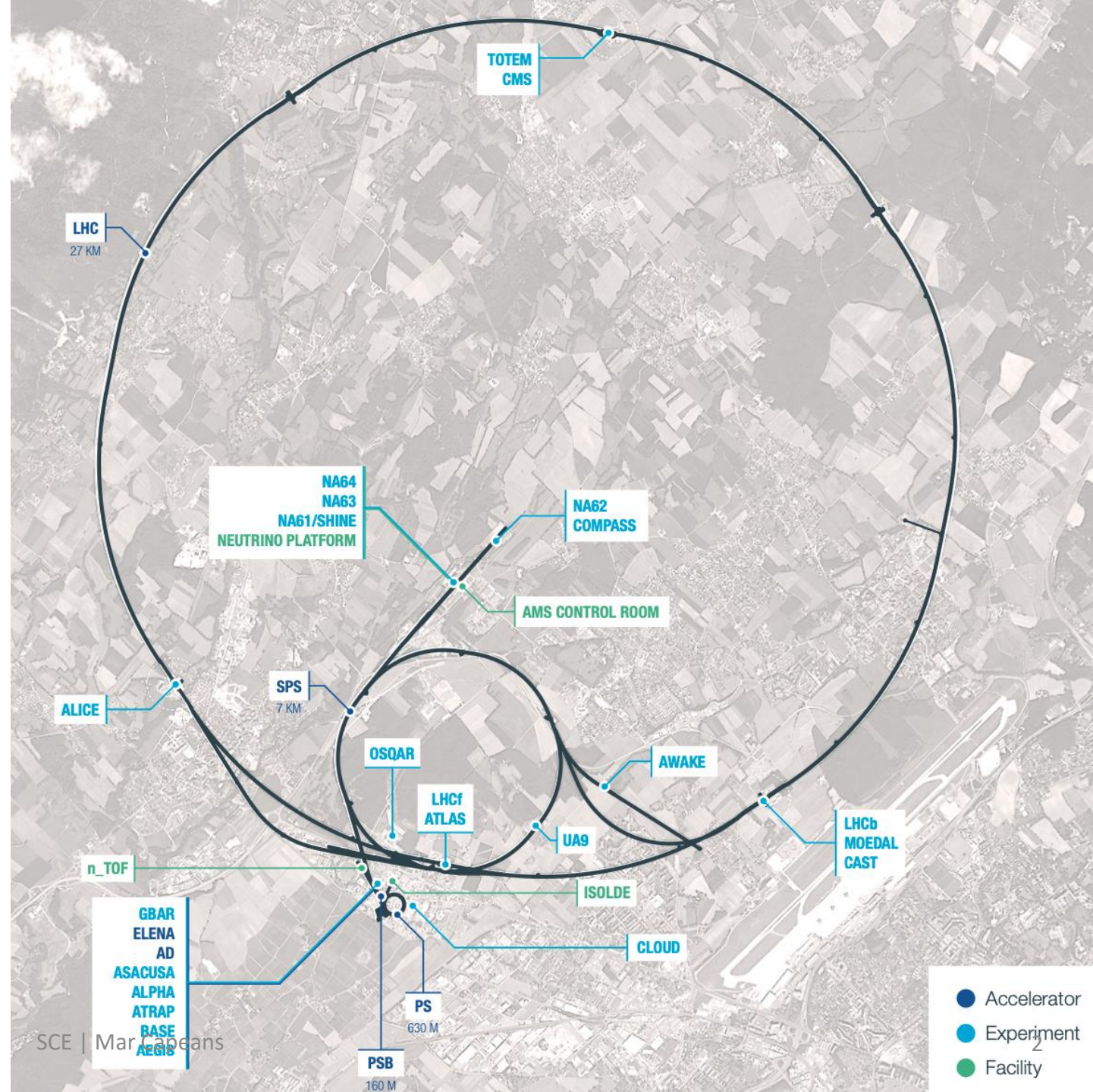
SITE AND CIVIL ENGINEERING DEPARTMENT



Mar Capeans

CERN

- 23 Member States
- 3,600 employees
- 12,500 scientists (110 nationalities) using the Laboratory's facilities
- 35 Non-Member States with Co-operation agreements with CERN
- 1,200 MCHF annual budget



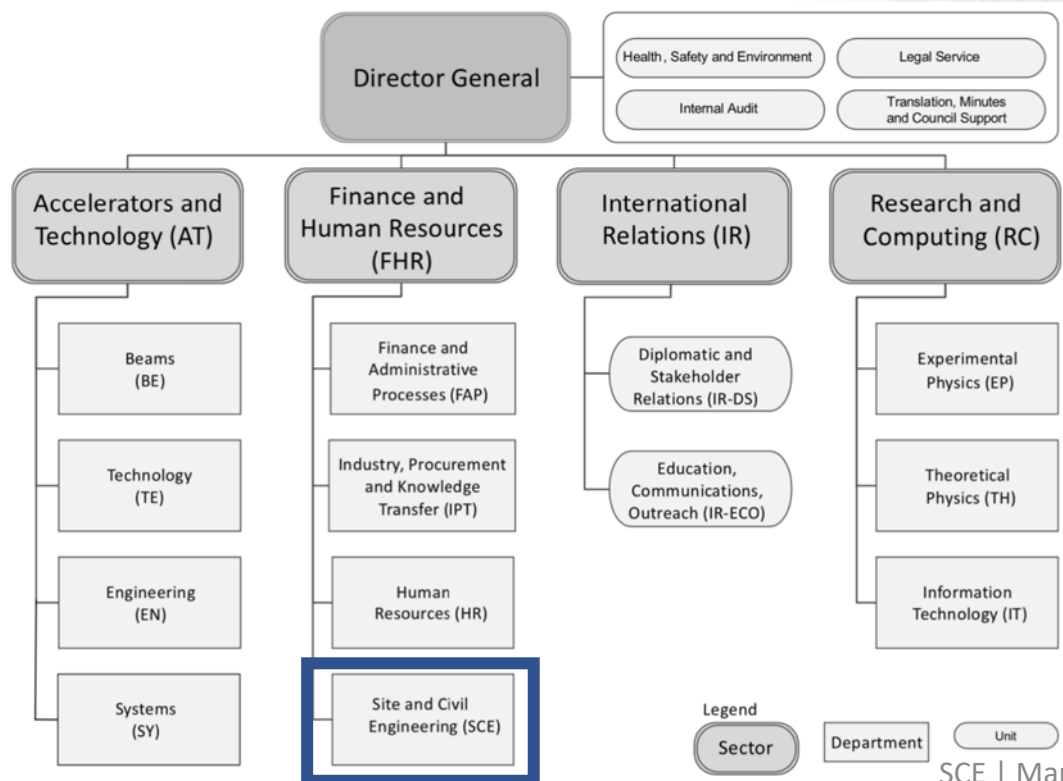
KEY FIGURES

- 590 ha (220 fenced)
- 2 main sites and 15 satellite sites
- 670 buildings from 10 m² to 20.000 m²
- 65% built before the 70's
- 70 km tunnels and 80 caverns
- 30 km roads
- 1000 km technical galleries and trenches
- 9000 persons/daily
- 490 hostel rooms
- 8500 working places
- 4300 parking places in Meyrin, 1400 in Prévessin
- 25000 daily movements to- and inter-sites
- Public transport links in CH, not in FR



Site and Civil Engineering (SCE) Department

The Site and Civil Engineering (SCE) Department manages and develops CERN's real estate assets and infrastructures in agreement with CERN's scientific strategy, as well as all the services related to the caretaking and operation of the CERN site.



Values and vision

Create an inspiring and welcoming environment for CERN's scientific community now and in the future.

Manage site assets and services in a **transparent** way

Cooperate with other CERN Departments, the Experiments and the Host States

Plan at long-term, **regularly updating** and aligning to evolutions in CERN's scientific program and future projects

Protect the site by a **reflected** interplay between preservation and modernization

Ensure working conditions at the site providing a **high level** of safety, reliability and security

Implement **coherent** service management

Plan and **prioritize** projects according to strategic importance, urgency, financial viability and **within environmental and mobility objectives.**



An extensive offer dedicated to CERN's Community

Roads



Buildings



Housing



Catering



Mobility



Cleaning & Waste



Electricity



Shipping



Goods reception



Civil engineering projects



Storage



Service desk



Reporting solutions



HVAC & fluids



Internal distribution



Galleries



Metallic structures



Infrastructures



Energy management



Architectural



Building shell



Building technology



Landscaping



Installation



Maintenance



Raw materials



Keys



Accesses



Site security

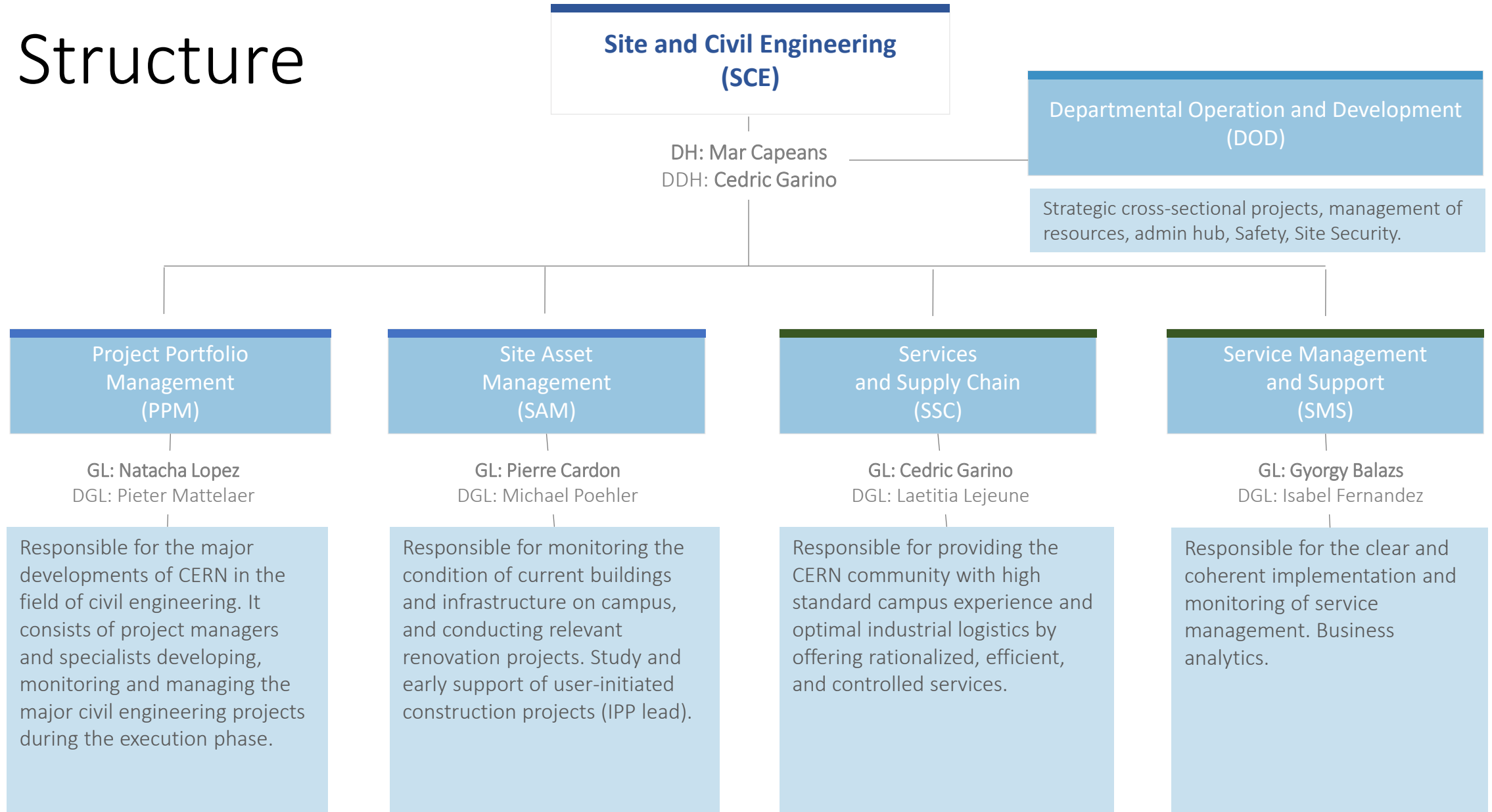


Mail



and so many others ...

Structure



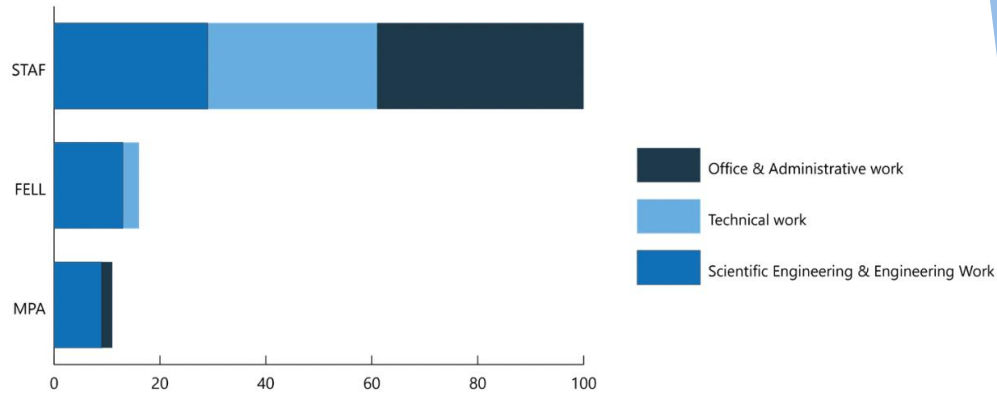
Profile Activities

(2022 data)

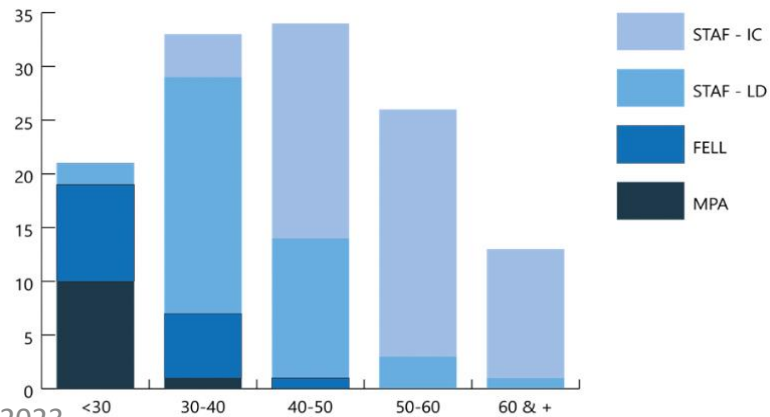
(SCE budget MCHF, average 21-25)

139 FTE workforce

MPE/MPA by professional category



MPE/MPA distributed by age



4.12.2023

SCE | Mar Capeans

25 M

OPERATION

- 40% Site Services M&O
- 25% Site Assets M&O
- 20% Site Security & Registration
- 5% IT Services (SNOW)

16 M

CONSOLIDATION

- Yearly program
- Emergencies
- ATS Consolidation

43 M

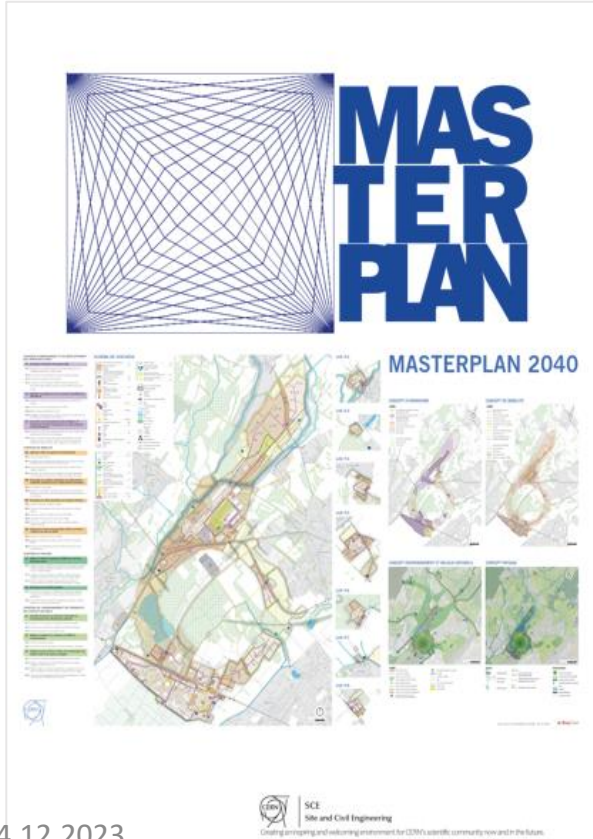
PROJECTS

- 60% New buildings
- 30% HL-LHC
- 9% Renovation
- 1% Security Infrastructure



CERN's Masterplan2040

It is a document to inform and inspire a reasoned and meaningful dialogue about the management and update of CERN's site. It is therefore a key document to guide and improve the management and use of land and space at CERN



The **Masterplan** will be used in a variety of practical ways such as:

- To deliver better on **CERN's environmental objectives**;
- To support decisions in the **approval process of infrastructure projects**;
- To **reveal trends and analyse** effectiveness of land planning and management;
- To connect spatial and infrastructure **planning with budgeting** and investment decisions;
- To ensure that “privileges over” and “ownership of” space do not hamper the optimization of the existing space and potential savings;
- To favour top-down Project Proposals initiated by a high-level objective;
- To **plan better services** for the Organization and its scientific community.

MASTERPLAN 2040

Framework objectives and measures

MANAGEMENT OF RESOURCES

INTEGRATION WITH SURROUNDING LANDSCAPE

BIODIVERSITY

LANDSCAPE IDENTITY

POLLUTION

ENVIRONMENT

LANDSCAPE

PARKING

DENSIFICATION

CIRCULATION

BUILDING MANAGEMENT

URBANISM

MOBILITY

ALTERNATIVES

FONCTIONNALITY AND READIBILITY

INTERSITE TRANSPORT



Campus Services Roadmaps

CERN Masterplan 2040



WASTE

CERN SCE Site and Civil Engineering

EDMS NO. 0.1
REV. DRAFT
VALIDITY

CERN WASTE MANAGEMENT ROADMAP

Abstract
This document enumerates CERN's long-term objectives, strategy, and action plan to ensure an efficient waste management fully aligned with local regulations and CERN's environmental objectives.

Prepared by: C. Garino	Date: 2022-05
Verified by: SCE Group Leaders	Date: 2024-M
Approved by: M. Capeans	Date: 2024-M
Distribution: N. Surname (DEP/GRP) (in alphabetical order) can also include reference to committees	

HISTORY OF CHANGES

Rev. No.	Date	Description of Changes (major changes only, minor changes in EDMS)

Page 1 of 4 Template EDMS No. 2443093

STORAGE

CERN SCE Site and Civil Engineering

EDMS NO. xxxxxxxx
REV. 0.1
VALIDITY DRAFT

CERN STORAGE MANAGEMENT ROADMAP

Abstract
This document enumerates CERN's long-term objectives, strategy, and action plan to ensure an optimal use of CERN storage capacity.

Prepared by: C. Garino	Date: 2022-05
Verified by: SCE Group Leaders	Date: 2024-M
Approved by: M. Capeans	Date: 2024-M
Distribution: N. Surname (DEP/GRP) (in alphabetical order) can also include reference to committees	

HISTORY OF CHANGES

Rev. No.	Date	Description of Changes (major changes only, minor changes in EDMS)

Page 1 of 3 Template EDMS No. 2443093

MOBILITY

CERN SCE Site and Civil Engineering

EDMS NO. 2694265
REV. 0.1
VALIDITY DRAFT

CERN MOBILITY ROADMAP

Abstract
This document enumerates CERN's long term objectives, strategy, and action plan to ensure the mobility of all persons entering the Organisation in a transparent, efficient, and sustainable manner.

Prepared by: I. Bejar Alonso, M. Poehler	Date: 2022-01-26
Verified by: SCE Group Leaders	Date: 2024-MM-DD
Approved by: M. Capeans	Date: 2024-MM-DD
Distribution: N. Surname (DEP/GRP) (in alphabetical order) can also include reference to committees	

HISTORY OF CHANGES

Rev. No.	Date	Description of Changes (major changes only, minor changes in EDMS)

Page 1 of 3 Template EDMS No. 2443093

MANAGEMENT OF RESSOURCES

Control the resource requirements for the operation of tertiary infrastructures:

- Improve energy consumption and reduce greenhouse gas emissions
- Promote new energy-generation technologies
- Limit the increase in water consumption.

BIODIVERSITY

Initiate an action plan in favour of biodiversity, green spaces and protected species:

- Continue to implement the rainwater management strategy at CERN
- Draw up an inventory of the existing biodiversity, protected species and green spaces
- Continue the development of the ecological continuity of environments and wildlife corridors.

POLLUTION

Control and mitigate CERN's environmental pollution:

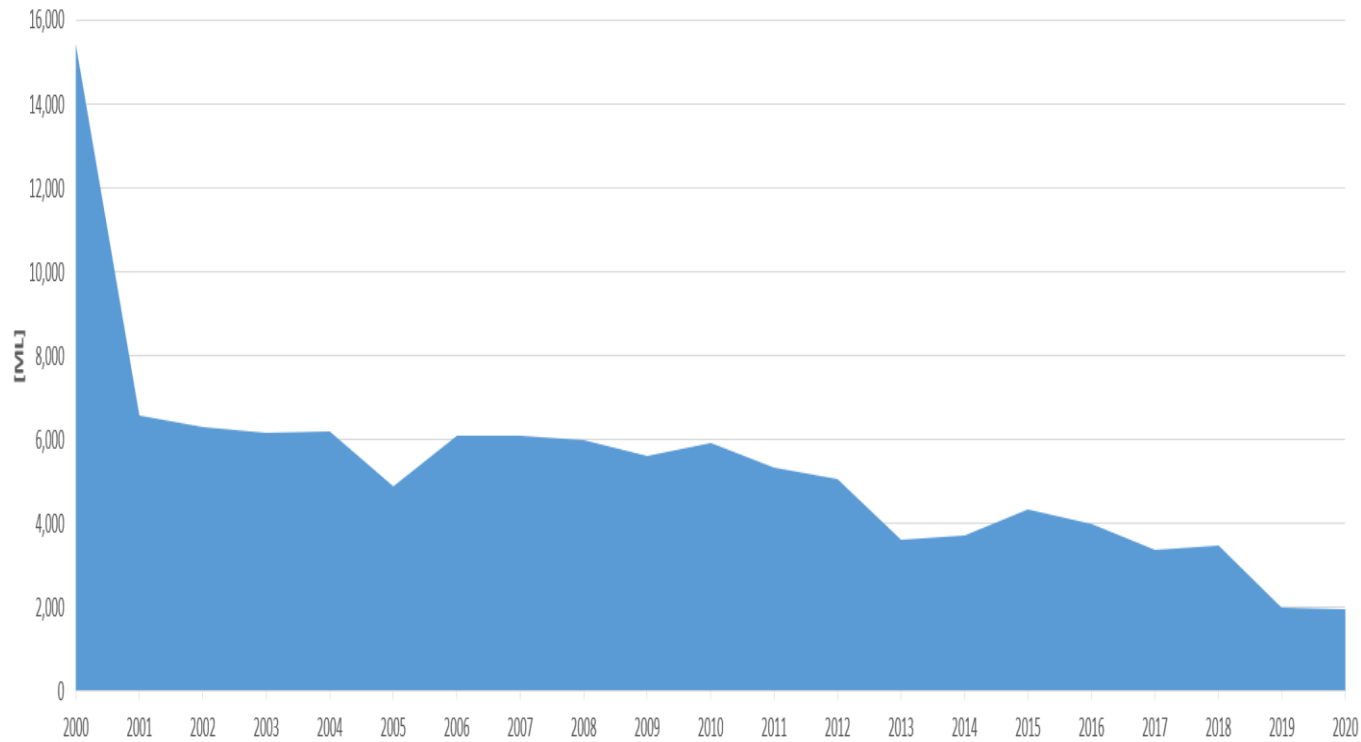
- Limit noise pollution
- Increase the recycling rate and reduce waste production



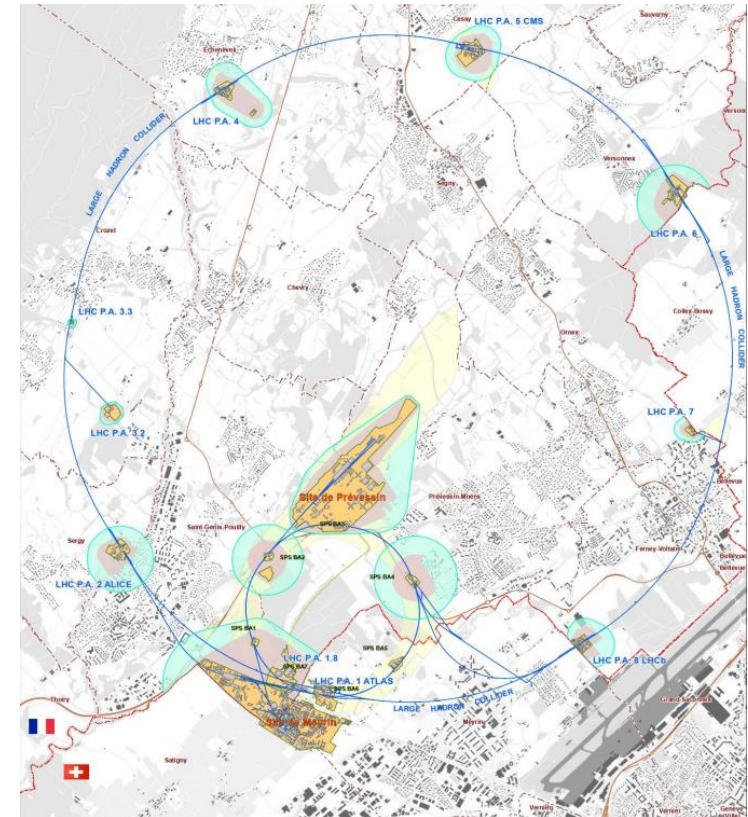
MASTERPLAN 2040: Environment

WATER

Annual water consumption



NOISE



MASTERPLAN2040

DENSIFICATION

Densify land occupation by ensuring flexibility of use

- Identify the areas set aside for development and define priorities
- Continue to monitor CERN's development
- Draw up a land improvement plan
- Favour taller buildings where site conditions and building use so permit

BUILDING MANAGEMENT

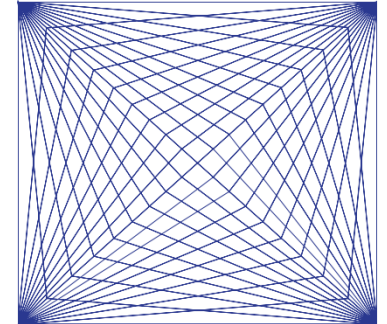
Standardise the use of built-up areas:

- Develop a policy for the management of built-up areas with a specific strategy for each purpose
- Continue monitoring existing buildings
- Continue the renovation programme
- Propose a specific land-use area on the Swiss side of the CERN site and define regulatory provisions

FUNCTIONALITY & READABILITY

Consolidate the functionality of the Meyrin and Prévessin sites and the experiment sites, and make the Prévessin site autonomous :

- Enhance the organisation and coherence of the sites by creating specific zones: visitor, academic, scientific-technological .
- Create one or more decentralised service hubs on the existing and future sites, notably bringing together amenities, restaurants, public spaces, lawns, gathering areas, etc






Renovations, consolidation and demolitions



Meyrin



Prévessin



-  New construction
-  Renovation
-  Demolition

-  Planned and funded
-  Planned and funded

B777

<https://building777.web.cern.ch>



Functional objectives

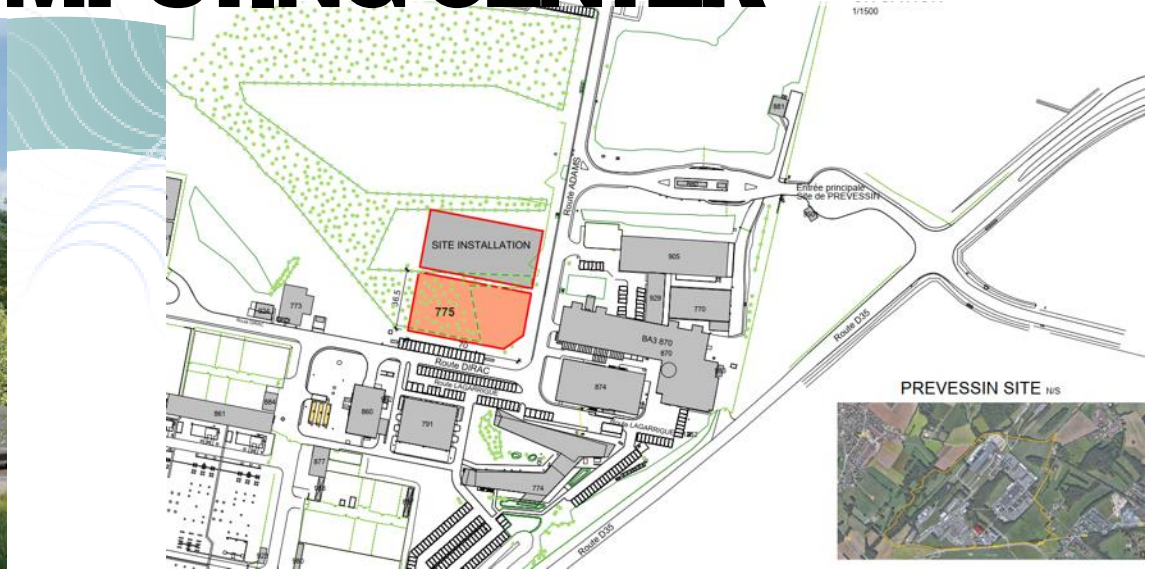
- New office ($\approx 475p$) and laboratory space ($\approx 1000 \text{ m}^2$) and meeting rooms for Accelerator & Technology Sector
- Social & service hub for Prévessin Site, incl. new Restaurant
- Soft mobility features

Status:

- Preliminary design completed
- Design development: value engineering and internal space distribution being finalized ($\sim 530p$)
- Building permit Q1 2024
- Construction tender dispatch planned Q3 2024

B777 [m ²]	Net area	Demolished	Emptied	Transferred	Rental End	Ratio
	6700	1700	1500	3000	0	90%

PREVESSIN COMPUTING CENTER



Purpose : The Contract is for the design, construction and 10-year M&O of the building and equipment.

Needs : Initial capacity of 4 MW available for IT equipment with stepwise future increases to 12 MW. To meet CERN's environmental goals the project incorporates the following considerations :

- The PCC is designed to be energy efficient with a target PUE (Power Usage Efficiency) of 1.10 (1.15 contractual)
- Optimised water consumption via a recirculation system lowering consumption in hot periods
- All cleared vegetation will be reconsolidated
- The acoustic study used for design of the building follows CERN commitments
- A heat recovery system is foreseen for up to 25% of power produced to be recovered
- Green terrace on the roof

CIVIL WORKS EXECUTION :

- Building foundations – 80%
- Ground level concrete works – 50%
- Below slab networks – 25%

TESTING & COMPLETION :

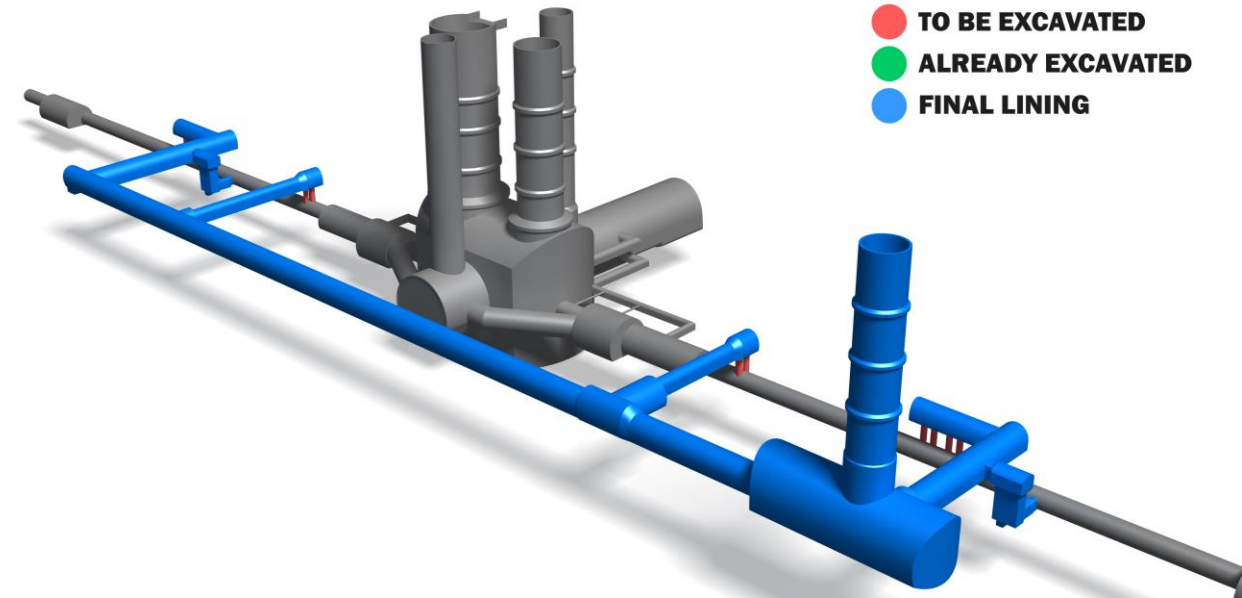
- PCC Testing – Mar to Sept 23
- Operational from October 23

PREVESSIN HEATING PLANT :

- MTP request 2021 and again in 2022
- Operational from 2026 if approved in this MTP

- EXISTING STRUCTURES
- TO BE EXCAVATED
- ALREADY EXCAVATED
- FINAL LINING

High Luminosity LHC



SITE CONSOLIDATION

PRIORITIES

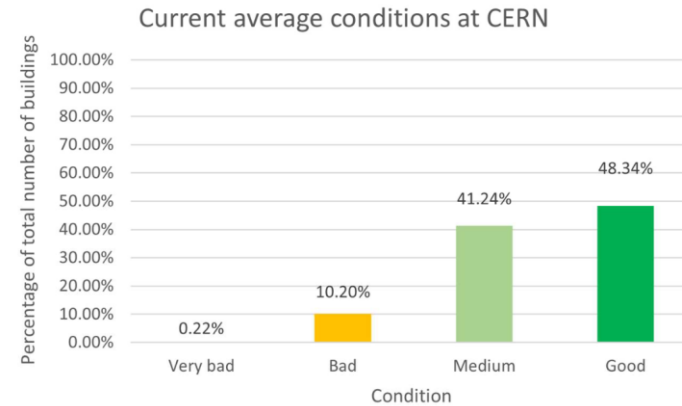
- Safety
- Strategic value wrt scientific goals
- Sustainability: durability, environmental impact, energy performance

AMBITIONS

- Global renovation of up to 2 buildings/y
- Densify consolidated space
- New space management policy
- Demolish depreciated space

PROCESS

- Data-driven decisions



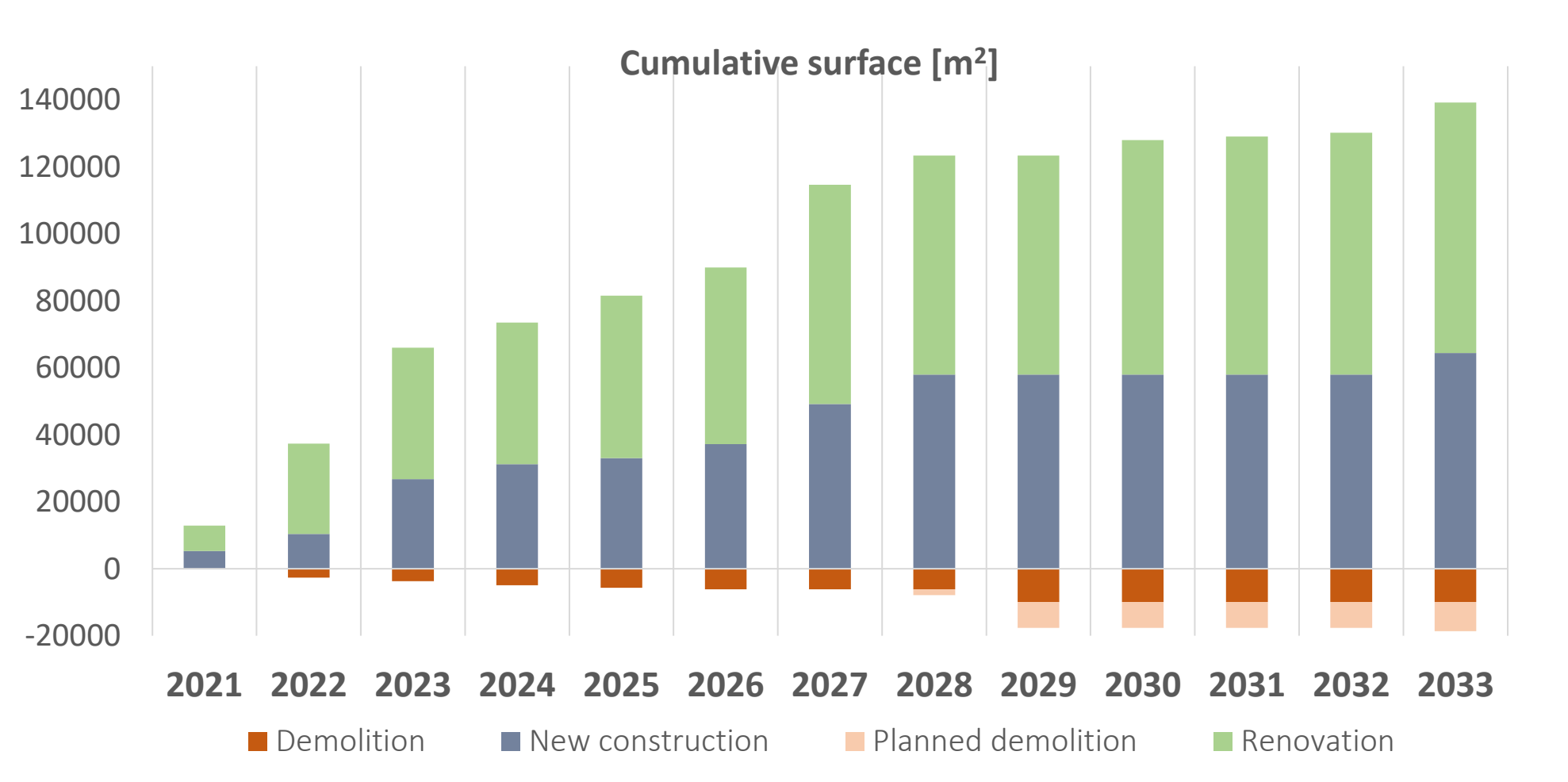
- Standardization of requirements definition according to Masterplan objectives and approval process for execution
- 5-year view

SPECIFICATIONS

- Global renovations
- Regulations compliance
- Energy efficiency improvement: > 60%
- Monitoring heating, electrical and lighting consumption
- Operation of HVAC, Heating and lighting consumption according to the outdoor temperature, occupation of the premises, eco-mode
- Favor centralized networks

Impact on surface

Total surface built at CERN: 430 000 m²



MASTERPLAN2040



PARKING

- Optimise the car-parking facilities and their management :
- Limit car parking
 - Privilege car parks close to the main road network in the context of new developments
 - Continue the development of facilities for soft-mobility
 - Develop communication promoting a reduction of the impact of people's mobility at CERN

CIRCULATION

Promote efficient and fluid access to and circulation on the CERN sites :

- Optimise the fluidity of access to the CERN sites.
- Improve the hierarchy of the road network inside the CERN site.
- Continue developing accessible facilities for people with reduced mobility.

ALTERNATIVES

Encourage alternatives to individual motorised transport for commuting :

- Encourage car sharing.
- Improve the continuity, safety and comfort of soft-mobility routes and provide parking for bicycles.

INTERSITE TRANSPORT

Promote alternatives for travelling between the CERN sites :

- Continue developing facilities associated with collective transport on site.
- Optimise the management and supply of CERN vehicles
- Expand and diversify CERN's bicycle fleet.
- Continue developing the network of footpaths and cyclepaths on site.

MASTERPLAN2040

INTEGRATION WITH SURROUNDING LANDSCAPE

Integrate the CERN sites with the surrounding landscape :

- Integrate sites harmoniously with the existing features of the overall landscape and with the views onto that landscape
- Enhance the CERN site perimeters by planting diverse hedgerows that will contribute to the overall ecological network
- Implement an architectural strategy to enhance the image of CERN's buildings and emblematic public areas

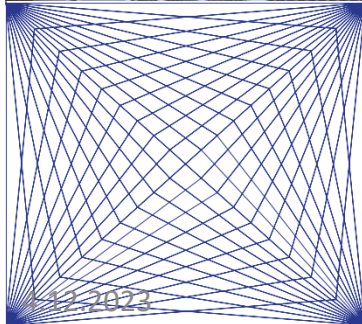
LANDSCAPE IDENTITY

Develop a landscape identity :

- Harmonise and enhance the attractiveness of the landscape developments and gathering areas, and create a furniture and signage catalogue
- Reduce islands of heat and plant trees and shrubs close to existing and future paved or tarmacked spaces, car parks and roads



LANDSCAPE



12.2023

TECHNOLOGY & ENVIRONMENT

INNOVATION PROGRAMME ON ENVIRONMENTAL APPLICATIONS

FROM CERN TO SOCIETY

CIPEA: Developing advanced technologies linked to environment and sustainability

E.g. solar thermal panels derived from vacuum technology; CO₂ cooling technology; superconductive power transmission lines and current leads

GREEN VILLAGE

FROM SOCIETY TO CERN TO SOCIETY

- Enabling rapid access to CERN campus as a test site for technologies linked to environment and sustainability
- Accelerating the commercialization of ideas, technologies and prototypes
- Involving Young Innovators (new ideas for unforeseen applications)
- **Challenges:** waste management, mobility, energy efficiency for tertiary activities on campus, space management, IoT, Zero-waste, urban analytics, ...

Green Village: Focus Areas for Collaboration



Main conditions:

- **Technology Maturity:** Must be beyond proof-of-concept (TRL 4-6).
- **Sustainability Focus:** Address a clearly identified sustainability challenges at CERN.
- **Timeliness:** Should be feasible in reasonable timescale.
- **Acceleration of sustainable solution**
- **Realistic Testing Environment:** Should necessitate a city-like environment to accelerate the sustainable solution.
- Focus on **research collaboration**; not procurement.
- **Compliance:** Must adhere to CERN's Health, Safety, and Environment (HSE) standards and access rules.



4.12.2023

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<https://sce-dep.web.cern.ch>



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