

2021
2022

CERN
SITE AND CIVIL ENGINEERING
At a Glance



SCE
Site and Civil Engineering

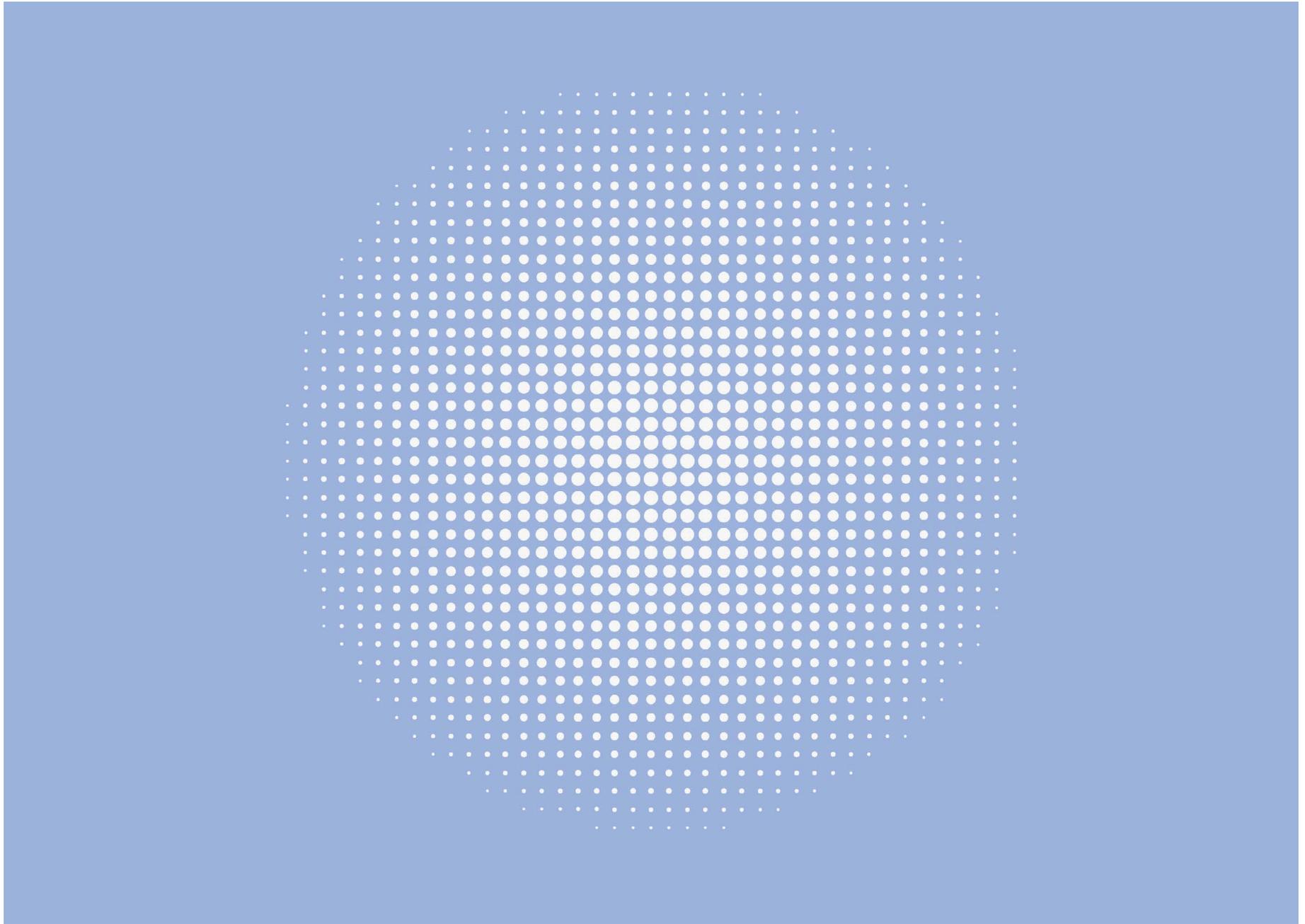


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Letter from Mar Capeans Garrido

SCE Department Head

I have been passionate about environmental issues for a long time. This enthusiasm partly stems from growing up in the north of Spain, with spectacular forests and sea landscapes, and it has grown further thanks to my daughters, who are naturally engaged in fighting for the planet. After being a particle physicist for the last thirty years at CERN, I am today heading its Site and Civil Engineering (SCE) Department, which often translates and implements CERN's proactive commitments towards environmental sustainability into the reality of the CERN site.

CERN provides a unique complex of particle accelerators to conduct world-class research in fundamental physics, bringing together people from all over the world to push back the boundaries of science and technology for the benefit of all. To accomplish its mission, CERN welcomes over 8,000 people a day, being members of personnel, contractors and scientific users, as well as more than 150,000 visitors a year. 17 sites extend over 620 hectares in France and Switzerland, with 670 buildings from 10 m² to 20,000 m², 70 km of tunnels, 30 km of roads, 1,000 km of technical galleries and trenches. Over the last 68 years, CERN has become a city within a city.



SCE manages this “city” and the impact of its operations, particularly in terms of mobility, environment, landscape and urbanism, and at the same time it ensures that services and facilities needed by our scientific community to work at CERN are reliable and efficient. Our vision is to create an inspiring and welcoming environment for CERN's scientific community now and in the future.

A key objective of 2021 has been the elaboration of a long-term strategy to consolidate and develop the site considering the strategic importance of buildings with respect to the scientific priorities of the Laboratory, and where sustainability becomes a driver for decisions. CERN's Masterplan 2040 was released at the end of the year, being a strategic document both for the Department and for CERN, with the objective to inform and inspire a reasoned and meaningful dialogue about the management and update of CERN's site. The Masterplan 2040 has guided other initiatives, among which the preparation of specific roadmaps and workplans for many areas under the responsibility of SCE, like mobility, waste management, storage and outdoor spaces.

The concrete plans to improve the site between 2021 and 2025 have been set. Two new sustainable constructions will add more than 25,000 m² of new space at CERN and will allow the demolition or renovation of older buildings and spaces, and create opportunities to optimise space management and the usage of the CERN site. We have also reworked the long-term Site Consolidation plan favouring global renovations of the large stock of buildings and continued the targeted maintenance campaigns to gradually improve the site. We have dealt with about 60 bottom-up infrastructure requests coming from all Departments in the Organisation, to transform or build new facilities, large and small; about 32 projects were approved and integrated into the already heavy-loaded SCE working programme. We also integrated the Future Circular Collider (FCC) Feasibility Study in the portfolio and a new team across different SCE units has been set up to lead the civil engineering workpackages.

The smooth operation of the campus continued to be a priority of the SCE teams, which modulated services in synchrony with the different COVID levels and presence on site. Major renovation works took place in Hotels 38 and 39, and in the Restaurants. In general all the services are being re-shaped to increase the positive impact on CERN's community and on the environment. We have launched pilots for new mobility services like adding a fleet of shared electrical bikes, supported and initiated recycling campaigns, dealt with Brexit and many special and urgent shipping requests, opened a showroom at the CERN Stores.

In collaboration with the Industry, Procurement and Knowledge Transfer (IPT) Department and the technical Departments, a CERN-wide standardisation strategy was approved, with technical sub-committees fed with experts across the whole Organisation to optimise cost-effectiveness for the procurement of recurrent materials, components and equipment.

The service management team, in charge of ServiceNow and the ServiceDesk, contributed to running efficiently about 380 services CERN-wide, handling about 20,000 requests of varied nature, from renting a bike, to requesting a light bulb change in an office, to creating an authorisation to access the site. An additional 250 services for Data Privacy Notices were integrated in the tool to implement CERN's data privacy policy. In addition, much effort has been invested to integrate ServiceNow with other well-established tools used at CERN in the area of asset maintenance or finance.

The SCE team grows and evolves. Our focus is to increase diversity and inclusion in SCE, because they are critical components in creating an innovative environment. We aspire to create a culture where everybody is encouraged to be curious, to experiment, and to share what they know and learn. This is why we put so much emphasis over the past year to share the incredible amount of expertise and knowledge in the Department in Technical Seminars, via weekly Flash News and a refurbished website.

2021 is an example of what we can do together. This small report marks the first 21 months of SCE, and I am excited to see what we accomplish in the years to come.

Our Mission

The Site and Civil Engineering Department manages and develops CERN's real estate assets and infrastructures in agreement with CERN's scientific strategy, as well as all the services.

Our Values

How we conduct our mandate is just as important as what we do. We manage site assets and services in a transparent way. We cooperate with other CERN departments, the Experiments and the Host States. We plan at long-term, regularly updating and aligning to evolutions in CERN's scientific program and future projects. We protect the site by a reflected interplay between preservation and modernisation. We ensure working conditions at the site providing a high level of safety, reliability and security. We implement coherent service management. We plan and prioritise projects according to strategic importance, urgency, financial viability and within environmental and mobility objectives.

Our Vision

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

Site Asset Management



Pierre Cardon

I graduated in 2005 in civil engineering from ESTP school, followed by a 10 years working in the private sector as a consultant on tertiary and machine projects. In 2015 I joined CERN as project manager and project coordinator.

Mandate

The Site Asset Management (SAM) Group of the Site and Civil Engineering (SCE) department builds and maintains the Organisation's underground sites, buildings and civil engineering infrastructures. This Group is in charge of the operation, maintenance, design, tendering and work phases of HVAC, Electrical and Sanitary installations for tertiary and industrial buildings.

Sections

Technical Office & Geomatics

The SAM-TG Section integrates drawing and calculation office support, manages and maintains the CERN GIS system, provides geographical information and topography services, manages administrative processes related to the territory (i.e. construction permits) for the benefit of all civil engineering projects carried out at CERN.

Civil Engineering

The SAM-CE Section plans and manages the works on site guaranteeing the site operation and maintenance, it leads the consolidation programme of buildings, installations and infrastructures which include all phases from feasibility study, preliminary design to construction management and hand-over of complete mid-size infrastructures.

Infrastructure

The SAM-IN Section designs and manages HVAC, sanitary, and electricity projects for the tertiary asset of the Organisation, and is responsible for their maintenance and operation taking care of incidents and planned upgrades managing equipment selection, sourcing, manufacturing, installation, and commissioning.



2021-2022 Through a lens

In 2021 there was an important focus on reviewing and improving the processes to deliver on the SAM programme. The first priority was the re-organisation of the teams, now grouped by expertise to create and develop highly competent technical teams. We simplified and improved the efficiency of the Infrastructure Request Process (IPR): every new request for a modification of site infrastructures goes through a well-defined assessment and management process to ensure the technical and financial framework necessary to allow consistency and feasibility. We enhanced the ServiceNow tickets management, from where thousands of requests reach the group every year, by prioritising, grouping and reducing the processing time, as well as increasing the communication with the requesters at all stages.

We focused as well on long-term planning. We have completed the environmental and biodiversity action plan in close collaboration with EN and HSE Departments. We have reviewed and refocused the Site Consolidation Plan on the basis of a new inventory of the state of assets, the newest environmental regulations, and its alignment with CERN's scientific priority objectives.

Overall, SAM is managing about 40 mid-size civil engineering projects each year and 2022 saw for instance the completion of the full renovation of B108 or the installation of new boilers for the heating plant in Meyrin. Following our commitment with the ecological transition, the careful preparation for financial approval of flagship environmental projects revealed successful, with two sustainable heating plants and two water retention basins now under the SAM project portfolio. Last but not least, expert support to a myriad of projects has been done in the areas of structural calculations, design, permitting, and urbanism. The Geographic Information System (GIS) service, responsible for providing maps, plans and geographic or patrimony related information for CERN is developing exponentially, adding new features, monitoring capabilities and a drone fleet to increase the aerial photos library of CERN and digital elevation modelling capabilities.



Installation of one of the boilers in Meyrin's heating plant



Renovation of B108



Biodiversity inventory: Ophrys Apifera, rare orchid on CERN site

Departmental Operation and Development



Isabel Bejar Alonso

In 1995 I got my master's degree in physics at UB (Barcelona). One year later, I joined CERN where I have been involved in the scientific activities of the Organisation as a researcher, quality manager and coordinator of large-scale, international technology and science projects. During my career at CERN, I obtained my Master in Management of Technology from EPFL in 2001.

Mandate

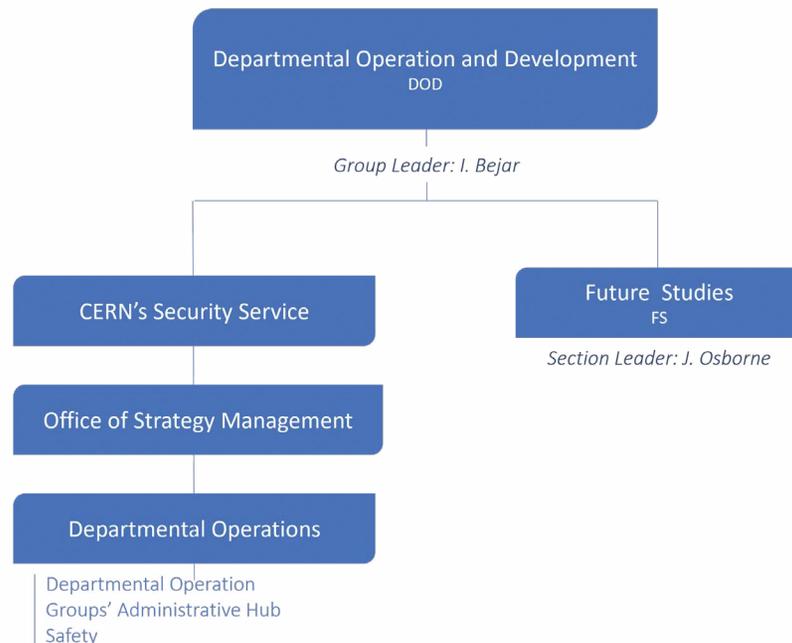
The Departmental Operation and Development (DOD) Group leads and supports efforts on strategic domains which connect the expertise in several units of the Site and Civil Engineering Department.

Group Organisation

The DOD Group was born in 2021 to support the SCE groups in strategic and administrative domains ensuring best practice sharing.

Different competency units provide departmental services, such as safety, administration, training, communication, and financial planning. CERN's Security Service provides and maintains the infrastructure and services necessary to ensure the security of all the people entering the Organisation, their property and CERN's property. The Office of Strategy Management coordinates crosscutting organisational projects, develops and supports project management processes, knowledge management and communication.

The Section Future Studies (DOD-FS) coordinates early-studies of civil engineering and infrastructures for future large-scale physics projects; in conjunction with other SCE Groups, it guides the studies from conception, feasibility and technical design towards construction preparation.



2021-2022 Through a lens

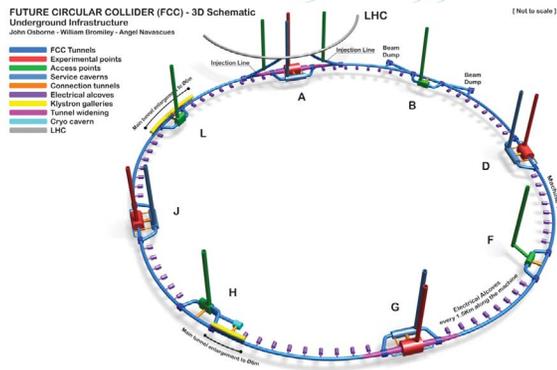
The administrative operation of the Department and Groups has been streamlined thanks to the work of the administrative hub to harmonise admin procedures and processes. Today all secretariats provide a set of common services handled identically for the Department and a series of ad-hoc services adapted to each Group's needs. Every process is documented and improved with the feedback received from the Groups, and they have been moved to ServiceNow to improve traceability.

The Strategy Office has focused on the preparation of policies and strategic roadmaps. New policies have been defined for training and space management in SCE. A departmental communication strategy has been set up and implemented delivering for instance weekly "flash news", articles and news for the CERN community, and a revamped SCE web page. Several inter-group processes have been reviewed such as the Infrastructure Request Process (IRP) to optimize the filtering and prioritization of civil engineering proposals. As for projects needing the expertise of several SCE Groups, and often from other Departments as well, mobility and space management have been high in the agenda. CERN's mobility roadmap has been updated with new long-term objectives and a map of actions for the next 5 years, and studies to explore the densification of the site and the rationalisation of the usage of space with the analysis of indicators have been carried out.

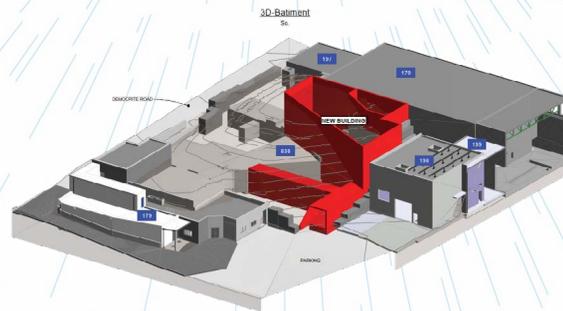
The Future Studies (DOD-FS) Section has continued supporting CERN's scientific program and future projects. Some of the achievements are the kick-off of the high-risk areas site investigations for the FCC Feasibility Study, further analyses for the Physics Beyond Colliders Study, the ISOLDE dump, the EPIC facility, and for the Linear and Muon Collider studies.

The Tunnel Asset Management team has finalised the inspection of tunnels during the LS2 with data being accessible via CERN Arc-GIS. New techniques have been deployed to monitor tunnels including optical fibres, photogrammetry, and deep learning.

The Security Service has continued improving services, enhancing its capacity and resilience. An important accomplishment has been the preparation of a new operational strategy accompanied of a review of physical systems, which includes an important new perimeter security project that is deploying, in all the CERN sites, the means to sustain different levels of security while reducing operational costs.



3D representation of the Future Circular Collider (FCC) under study



3D representation of the ISOLDE facility



Design of the entrance gate in LHC-Point 2

Services and Supply Chain



Cedric Garino

Graduated as Software Engineer in 2004 from university of Nice – Sophia Antipolis, I joined CERN in the former group GS-AIS (now FAP-BC) in 2009 after a few years in the private sector. From 2014 I took the opportunity to join site services, in particular the supply chain domain (logistics and CERN stores) which I led from 2015 to 2020. Since 2020 the mandate of the group also covers campus services which give me the chance to work with a fantastic team that innovates and develops services to meet the expectations of CERN's community!

Mandate

The SSC Group provides CERN's community with high standard campus experience and optimal supply chain execution. With the three sections within SSC, our field of work covers the areas of campus housing, catering, mobility within CERN, mail delivery, transport of goods, storage, CERN Stores, waste management, sales and recuperation, among many other services.

Sections

Logistics

The LS Section provides CERN's community optimal logistics services associated to goods/material inbound and outbound flows, such as shipping (external transport management, import/export documentation, customs & fiscal advisory), goods reception, internal distribution, removals, mail, and storage (accelerator equipment and special waste).

Campus Services

The Campus Services Section provides CERN's community with high standard campus experience by offering rationalised, efficient, and transparent services. It covers all needs for a smooth campus life such as installation (payment of removal fees and diplomatic privileges), housing on site and support to external offers, catering (3 restaurants, 5 cafeterias, vending machines park), mobility (shuttles, car fleet, car sharing, e-bike sharing, bike rentals, fuel stations) and cleanliness & recovery including, waste management, recuperation & sales operations.

Supply Chain

The SC Section provides CERN stores service, which manages supply of referenced items to CERN's community (i.e. with recurrent demands and a long-term interest for the Organisation). It covers referencing of items based on the needs of the CERN's community through a referencing process, a centralised front line capturing and processing demands, stock management and replenishment using a pre-defined contractual framework following CERN's procurement rules, warehousing operations (reception, quality control, put-away, inventory, picking preparation) and additional services such raw material cutting services and fit-to-purpose Personal Protective Equipment distribution and control.



2021-2022 Through a lens

2021 has been a year paving the way to align the group with the new SCE departmental values, vision, and objectives, and 2022 has seen the beginning of services being transformed with care, creative thinking, and new tools to address the needs of CERN's community today and in the future.

Three core priorities have been defined:

- Shape the future of services to increase positive impact on CERN's community & environment
- Target operative excellence and next level of maturity
- Develop an inclusive environment fostering staff engagement

Logistics and Supply Chain services have been in the front-line supporting the end of LS2. Structural changes have also been initiated to prepare the services to future challenges. The Logistics industrial support contract has been renewed, which has been a chance to review and improve processes and operations based on the experience and learnings accumulated in the past years. The group contributed to the first edition of RI Logistica (logistics collaboration with other research institutes organized by ISS) and now is part of the association created afterwards. Continuous improvement using LEAN approach is on-going, to reduce manual shipping operations using industry-standard software solutions.

In strong collaboration with the IPT Department, a new CERN Standardisation Committee proposal has been presented and endorsed. Technical sub-Committees, led by experts from technical groups, have been organised and have started producing results to identify KPIs, rework strategic technical specifications of referenced material in CERN's stores, and agree on quality assurance plans and associated quality controls.

Campus Services have diligently adapted to the constantly evolving COVID-19 situation by working on new layouts of the restaurants, extra seats and infrastructure in temporary tents and the terraces, deploying a live counting system at R3, renovating hotels, adapting shuttles plans, reconfiguring cleaning tasks, collection and treatment of used masks. It has definitely been challenging on a daily basis, but it has also been an opportunity to refurbish and renovate critical infrastructure working together with the civil engineering experts from the SCE-SAM and SCE-PPM Groups. Cleaning, waste and the recuperation & sales services have been integrated together in a "Cleanliness and Recovery Service" to develop synergies and offer a global vision. A LEAN workshop has been successfully performed to reorganise supervision of cleaning contract and activities. A new set of buildings have been equipped with recycling drop-off points. Two mobility pilots have been happily launched: E-bikes sharing and new car sharing using a dedicated app instead of keys.

2022 is the key year to grow towards a positive impact on environmental challenges. Successful pilots and committees shall become fully operational service solutions. New pilots, targeting zero-emission services, will be put in place and strategic principles and long-term objectives for mobility, storage and waste management operations are being developed. A massive renovation of CERN's main restaurant (R1 in the Meyrin site) is on the pipeline and a strategic plan for fleet renewal, targeting a reduction of 25% and zero-emission, is being prepared.



Project Portfolio Management



Mandate

From the initial conceptual design to the final delivery to the end user, the PPM Group manages all the major developments at CERN in the Civil Engineering field and its buildings. We group project portfolio managers which are specialists in the areas of development, experiments, infrastructure, building technology, sustainability and energy.



Natacha Lopez

Graduated in Civil Engineering in 1988 from EICCP in Valencia and ENPC in Paris, I worked until 1997 in several companies in the private sector until I joined CERN as a project leader of civil engineering and buildings.

2021-2022 Through a lens

2021 was a challenging year for the Project Portfolio Management Group. It was necessary to create and implement a new structure with the most suitable work methodologies to work as a team, while at the same time continue to develop the projects under our remit. With these two purposes in mind, we have drafted a Quality Assurance Plan that serves as guideline for the exercise of our activities, we standardised and harmonised the previous machine and tertiary project management policies, and optimised our project portfolio reporting tools thanks to the newly created quarterly monthly report to communicate to the management and other project stakeholders.

We also finalised several projects that we had in our hands from previous periods. The new B937 in Prévessin, grouping the activities of the Controls, Electronics and Mechatronics group in the Beams Department; the renovation of the Hotel B38, taking advantage of the fact that the campus had reduced its activity during the pandemic period; the demolition of B102, as part of the approach adopted in the infrastructure consolidation program, including a major depollution process much needed due to its 60 years of industrial and chemical activities and the extension of the nuclear class A laboratory of the B179 to create additional space for a safer handling of (nano) actinide material in the ISOLDE facility.

The year 2022 brought the completion of other major projects, like the envelop renovation of B180, one of the largest technical infrastructures in the Meyrin site, the renovation of B168-20-21 and full refurbishment of B108-164 for technical activities of the EP Department. All these projects are important deliverables of the SCE Site Consolidation programme.

The civil engineering package of the HL-LHC project started in 2018 and will be finished by the end of 2022, as it was foreseen and despite the COVID-19 pandemic and other current global socio-economic and political issues.

The construction of the new Computing Centre in Prévessin started also in 2022. This new facility will meet CERN's future computing needs, with an estimated 4 MW of initial capacity with progressive increases to 12 MW. Two technical buildings for the ATLAS and CMS experiments, whose upgraded detectors will require new CO₂-based cooling systems to exploit the physics opportunities offered by the HL-LHC project.

In short, 2021 was a year of structuring and planning as a group, while 2022 is a year of evaluation and improvement of our work methodologies and tools. All this, always with our major goal in mind: to develop great projects and finalise them on time and within budget.



Works of the new Prévessin Computing Centre



HL-LHC tunnel at Point 5



The renovated envelop of B180

Service Management and Support

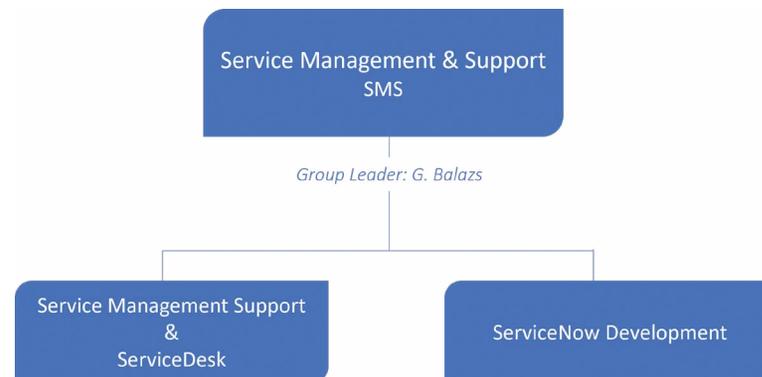


Gyorgy Balazs

I joined the SCE department in 2020, SMB at that time, after spending 12 years in CERN's IT Department. Previously, I led Network Deployment and Operations activities in the Communication Systems group where I took part in CERN's service management implementation from the very beginning. This experience led me to become a qualified service management expert complementing my studies in computing, telecommunications, industrial management and economics.

Mandate

The SMS Group strives to implement coherent service management processes and tools in the department and across all services at CERN joining the Service Management framework. Working in collaboration with the IT Department's Service Management team, the SMS offers service management consultancy, develops and operates the Service Management software platform for supporters (ServiceNow) and provides common entry points for end users to access services via the ServiceDesk and Service Portal.



2021-2022 Through a lens

In 2021 we redesigned the ServiceNow training offerings, with 28 sessions delivered in 3 different flavours (Basic, Advanced, Functional Manager).

We continued to build strategic partnerships with the IT Service Management team and other tool providers (e.g. InforEAM), concentrating on seamless integration of service delivery tools to avoid duplications and to hide complexity from end-users. Behind the scenes, we reduced manual effort to release ServiceNow updates by 70% through a high level of automation while aligning security compliance with the most recent recommendations. We documented the usage of different processes and features used in ServiceNow to prepare for the renewal of the service management tool in 2022, and established an implementation strategy to address data privacy requirements arising from OC11 (processing of personal data at CERN).

In 2022 the two latter subjects remain in our main focus. The renewal of the service management platform is well underway, while two major data privacy enhancements are being implemented. These are the limits of ticket visibility across unrelated services using our platform as well as the automated limitation of data retention according to service needs. Automatic data removal has already been implemented for various services dealing with sensitive data.

These changes are now also being announced through the CERN Service Management Forum which took place for the first time in June 2022, attracting 190 participants. The forum will continue to be organised three times a year to enhance knowledge exchange across services and to promote throughout CERN a continuous service improvement culture-based on industry best practices.

SCE in Numbers

Small works requests

+8,000

Treated in a year

Catering

2,500

Meals served per day

Conventional waste

+25T

Treated per week

ServiceNow

35,000

Requests served per month

Internal distribution

350

Distributions per day

Registration

300

Access cards issued per week

Impact on site

72,000

M² constructed or renovated

Mail

1,200

Incoming per week

Import & Export

200

Transactions per week

Biodiversity

101

New trees planted

E-mobility service

3,300

Users registered in the service

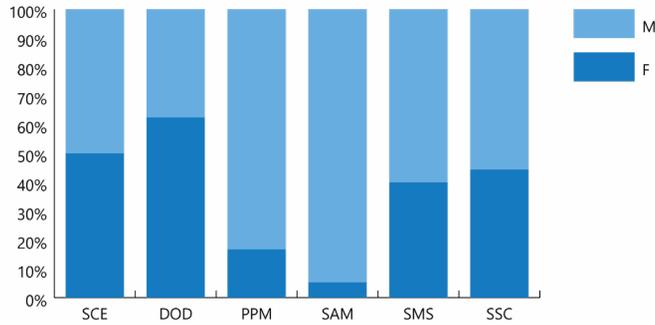
Shuttle transports

400

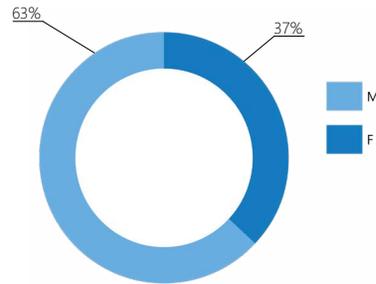
People transported per day

HR Statistics

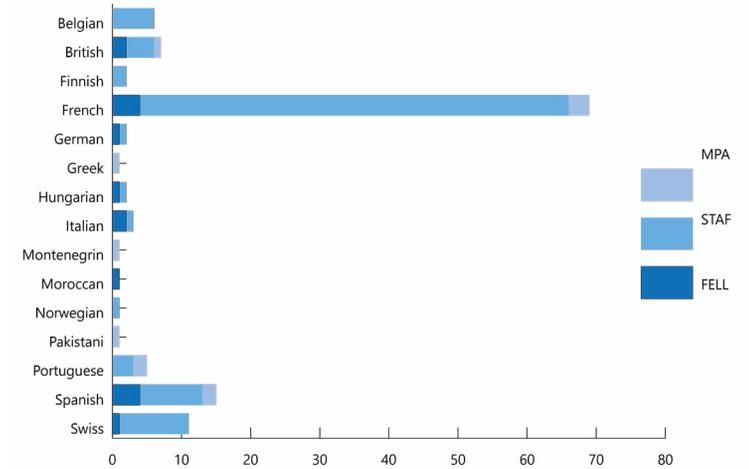
Staff gender distribution in the SCE Groups



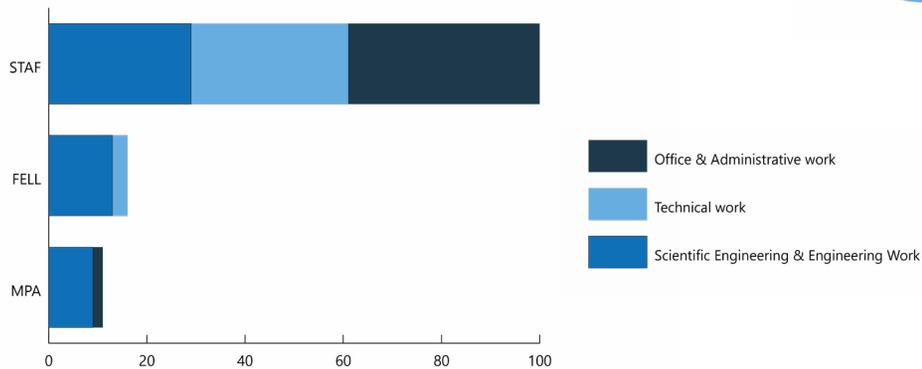
Gender distribution among SCE Management



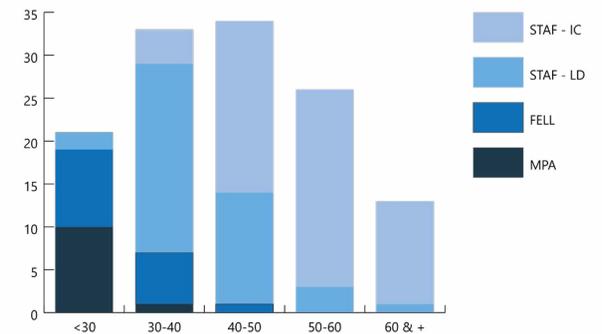
MPE/MPA distributed by nationality



MPE/MPA by professional category



MPE/MPA distributed by age



MPE: employed members of the CERN personnel (staff and fellows)

MPA: associated members of the personnel (students, trainees, associates)

SCE Management: Management Board + Section Leaders

What's Next?

Campus Development

Design studies are well underway to modernise the CERN Library (B52), construct an annex building (B184) for the HSE Radioprotection Group which enlarges the capacity of the Radioactive Waste Treatment Center, or fully renovate the envelope of B251 to increase its safety and energy performance, to name but a few. Naturally, the next batch of constructions and renovations on site is currently under intense preparation.

The rehabilitation of the iconic B60 has been anticipated six years with respect to the previous plans, and works will start in 2023. The design of two large, green buildings in Meyrin (B140+) and Prévessin (B777) has been kicked off, targeting modern, sustainable buildings equipped with all the expected facilities, including landscaping, soft mobility, flexible office layout and conference rooms, and integrating the technical requirements imposed by the newest environmental regulations. While their occupancy is expected from 2026, setting up these innovative projects brings opportunities to change the culture with respect to space management at CERN and move towards a more global and dynamic model.

Campus Services

A global study to improve outdoor spaces in Meyrin and Prévessin has been completed, and the execution of three projects are a priority in the second half of 2022 to start giving response to a need of having on site inclusive, informal working spaces and break areas outdoors.

Strategies and roadmaps for mobility, the rationalisation of storage space, and waste management have been developed and are accompanied by a set of concrete actions that start to be deployed and will improve the sustainability of CERN's operations at long-term.



Prévessin Computing Centre

Other environmental initiatives that have been approved concern the management of water on site, with the construction of water retention basins in Meyrin and Prévessin, and the construction of sustainable heating plants recovering residual heat from the LHC at Point 1 in Meyrin and the new Prévessin Computing Centre to heat the two campus.

Other projects having an impact on the campus experience is the improvement of all the perimeter of fenced areas of the sites, and the concept to establish an unique and modern CERN Welcome Center in B33, an initiative which has been started in collaboration with other Departments. For campus services, we will continue to work under the well-established culture of continuous improvement, working with defined KPIs and targets to monitor services performance and to continuously adapt to the needs of CERN community.

Green Village

In 2022, SCE and IdeaSquare set up “The Green Village” initiative to link CERN’s sustainability roadmap with industrial solutions for sustainability and the talent of young innovators. This visionary programme opens the CERN campus to established companies, large and small, academic institutions, research infrastructures, associations, to test and scale up early-stage innovation on site and share technologies and know-how contributing to Europe’s Green Economy.

Smart energy, green mobility, pollution and waste prevention and management, environmental quality, urban analytics and data solutions for space and land management, light and noise pollution abatement, wearable sensors, mobile applications, big data analysis to reduce the carbon footprint and biodiversity conservation are some of our challenges; we want to contribute to developing technologies needed to achieve the net-zero and get them ready to be deployed at large. Three pilot projects are already under preparation and we shall see a myriad of initiatives popping up on campus in the years to come.

25 by 25

Under the umbrella of CERN’s 25 by 25 strategy, SCE has now a Diversity and Inclusion fitness plan tailored to the Department. It commits all of us to placing the principles of equality, diversity and inclusion at the heart of our activities. The SCE Diversity and Inclusion Officer has been appointed in July 2022 and will oversee the implementation and progress of the plan, as well as serving as communication channel to/from the Department, and after all, helping us to create a culture where everybody feels part of SCE and is encouraged to participate, to be curious, to experiment.

Next “... At a Glance”

The next update of “SCE at a glance”, due by the end of 2023, will contain a back view of the status of the objectives we have set for the period 2021-2025, and we will report on the most important key performance indicators for the Department.

I look forward to report on our progress, analyse our successes and failures to understand where we are best and where changes are needed, and above all, where we should focus to continue moving forward, explore new options and imagine the best.

Mar Capeans Garrido
SCE Department Head



Amelie Meyer (SCE-PPM) in the gallery UR15 at Point 1

Selected Publications and Contributions to Conferences

FCC Civil Engineering Studies

- J. A. Osborne, "[FCC Civil Engineering Studies](#)", LCWS2021 International Workshop on Future Linear Colliders, Virtual event, 2021.

Forward Physics Facility (FPF) Civil Engineering

- J. A. Osborne, K. Balazs, "[Forward Physics Facility \(FPF\) Civil Engineering](#)", Physics Beyond Colliders Workshop, Virtual event, 2021.

Forward Physics Facility (FPF) Civil Engineering Study Update

- K. Balazs, "[Forward Physics Facility \(FPF\) Civil Engineering Study Update](#)", 3rd Forward Physics Facility (FPF) Conference, Virtual event, 2021.

The Forward Physics Facility at the High-Luminosity LHC

- J. A. Osborne et al., "[The Forward Physics Facility at the High-Luminosity LHC](#)", 2021 Snowmass Summer Study, Seattle, US, July 2021.

Use of FIDIC Conditions of Contract on CERN Projects

- L. A. Lopez, "[Use of FIDIC Conditions of Contract on CERN Projects, Official FIDIC International Contract Users](#)" Conference, 2021.

Future Circular Collider: a new 100km tunnel

- J. A. Osborne, "[FCC Civil Engineering Studies](#)", LCWS2021 International Workshop on Future Linear Colliders, Virtual event, 2021.

Lean Culture Integration

- C. Garino, "[LEAN Culture Integration](#)", RI.Logistica Conference, Virtual event, 2021.

Asset Management at CERN

- R. Cunningham and E. Perez, "Asset Management at CERN", European Workshop on Structural Health Monitoring, Palermo, IT, 2022.

The Forward Physics Facility: Sites, Experiments, and Physics Potential

- K. Balazs et al., "[The Forward Physics Facility: Sites, Experiments, and Physics Potential](#)", 2022.

How to limit the environmental impact of Science Projects

- M. Capeans, "[How to limit the environmental impact of Science Projects](#)", 2nd Joint ECFA-NuPECC-ApPEC JENAS-Seminar, Madrid, ES, May 2022.

Modeling Multiblock Systems: Computational Analyses Backed by Experiments

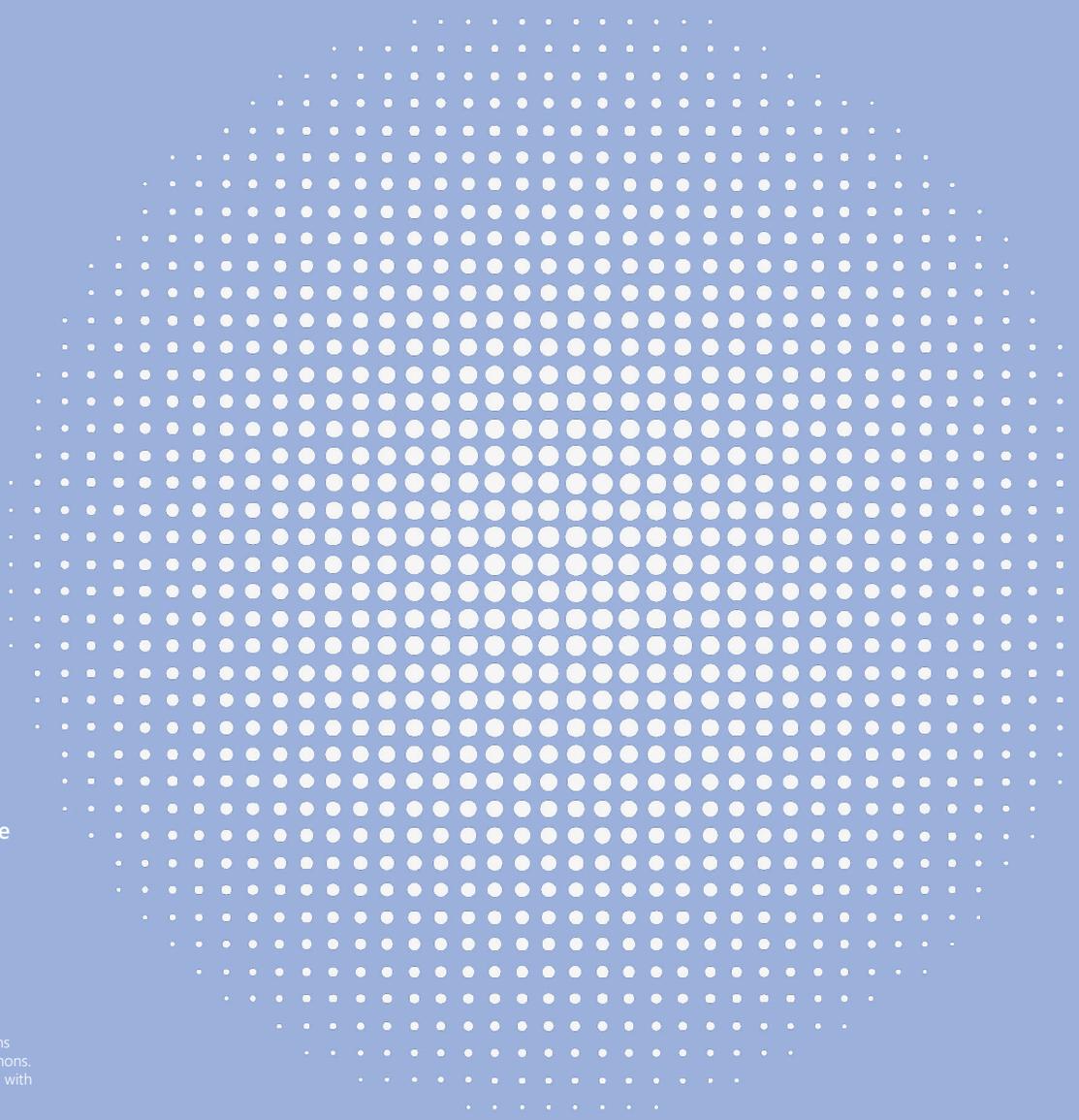
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Monitoring of an existing concrete-lined tunnel at CERN excavated in the molasse rock

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Exploring What Matters

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