

Mission Bay in San Francisco, the new “digital health” hub



Laurent Perrin/IAU idf

Mission Bay is the name of a major economic and urban project in downtown San Francisco. It combines the urban regeneration of extensive rail/port wasteland and the development of a biotech cluster around the new campus of the University of California in San Francisco (UCSF). This *Note rapide* supplements the *Science Cities* series of case studies.

Mission Bay is a recent and ambitious campus-cluster development project.

Planned in the city centre, it contrasts with the majority of American clusters in outlying areas, beginning with its illustrious neighbour, Silicon Valley, and places San Francisco at the forefront of an economic

revival based on multiple small businesses in line with the municipality's economic priorities. At Mission Bay, the vitality of UCSF and redevelopment of its campus play a leading role in the expansion of a cluster specialised in life sciences and new technologies. It is now nearing completion, which makes it possible to identify the key lessons.

The Bay Area, a very powerful economy driven by emerging technologies

Mission Bay is part of the Bay Area region, which encompasses San Francisco Bay. It covers nine counties: Marin, Napa, Sonoma, Solano, Contra Costa, Alameda, Santa Clara and San Mateo, and includes the cities of San Francisco, Oakland and San Jose, as well as the high-tech cluster of Silicon Valley and the heart of the Northern California wine region. With 7.3 million inhabitants, it is the second largest metropolitan area in California and the fourth nationally. Its population is growing steadily.

Although the cost of living there is particularly high, this is largely offset by the extraordinary

economic productivity and high per capita incomes.

The city of San Francisco is located in the heart of the Bay. It only numbers 826,000 inhabitants but benefits from a highly favourable economic environment. Its knowledge economy is extremely competitive and the area offers a unique business environment for companies whose competitiveness depends on creativity, innovation, technological leadership, and a diverse international and highly qualified workforce (half the population possesses a high-school or university diploma).

San Francisco is home to many corporate headquarters on the sectors of finance and services (Visa, Wells Fargo, Union Bank, etc.), FMCGs (Gap, Levi Strauss, Sephora, Benefit, etc.) but has grown in recent years thanks to companies specialised in information technology and the new media of software, games, the internet (1,800 companies like Salesforce, Twitter, Ustream, Yelp, Yammer and of course Google), life sciences (130 such as UCSF, Bayer, FibroGen, Nektar) and clean techs (over 210 such as Suntech, GCL).

Located approximately one hour's drive from downtown San Francisco, Silicon Valley, extends over Palo Alto, Mountain View and Sunnyvale, mainly in the county of Santa Clara, and remains the undisputed growth driver for the Bay's economy.

Economic reconquest of downtown San Francisco

In recent years, the city of San Francisco has adopted a policy of tax incentives for companies that move into its territory so as to attract new arrivals but also to encourage the relocation of activities to the city centre. The city is therefore beginning to present a real development opportunity for these companies. Some graduates and young talents, fed up with taking shuttle buses to Silicon Valley, are beginning to prioritise jobs in start-ups on the health/biotech and digital sectors located in the city centre, but outside the traditional business district. Companies can

benefit from job-support programmes (Employment Training Panel/ETP, One-Stop Career Link Centers) and various exemptions from charges for biotechnology companies located in the city, for those present in certain areas (Central Market, Tenderloin), etc. The city is maintaining its attractiveness thanks to a mission for economic development and employment, the Office of Economic and Workforce Development (OEWD).

San Francisco is also seeking to develop an innovation corridor, taking in, from north to south, the financial district, Treasure Island, Transbay, SoMa, Seawall Lot 337, Mission Bay, Central Waterfront

Life Sciences Overlay, Pier 70 and the Bayview Industrial District through to the proposed redevelopment of the former industrial district Hunter's Point Shipyard as an innovation hub. The Mission Bay project is an integral part of this innovation strategy.

Mission Bay, an urban regeneration project of the 1990s

Mission Bay is the name of a former swamp filled in with rubble from the 1906 earthquake, then occupied by the Santa Fe railway company. In the mid 1980s, the company Catellus, landowner, approached the municipality with a view to setting up a redevelopment project allowing it to make the best use of its land assets.

The 300 acres site (almost identical in size to the Paris Rive Gauche mixed development zone), near the city centre, the central artery of Market St under which runs the B.A.R.T. (equivalent to the RER in the Paris area) and the Caltrain railway station (terminus for commuter and intercity services) enable a relatively dense mixed operation to be envisaged.

The project was initially entrusted to the San Francisco Redevelopment Agency (SFRA), a developer dependant on the state of California. At this time, with the Parnassus Heights campus being saturated, UCSF had started looking for a new site to accompany its development. Mission Bay rapidly emerged as the obvious choice and an agreement was reached with Catellus and the municipality to give up 42 acres to UCSF so that it could create a new campus dedicated to an emerging area of research: biotechnologies.

Several development plans were studied, but the real estate market was not buoyant enough to launch the operation. As a result, nothing came of it until the late 1990s.

The operation to redevelop Mission Bay could finally start in 1998, based on a master plan ap-

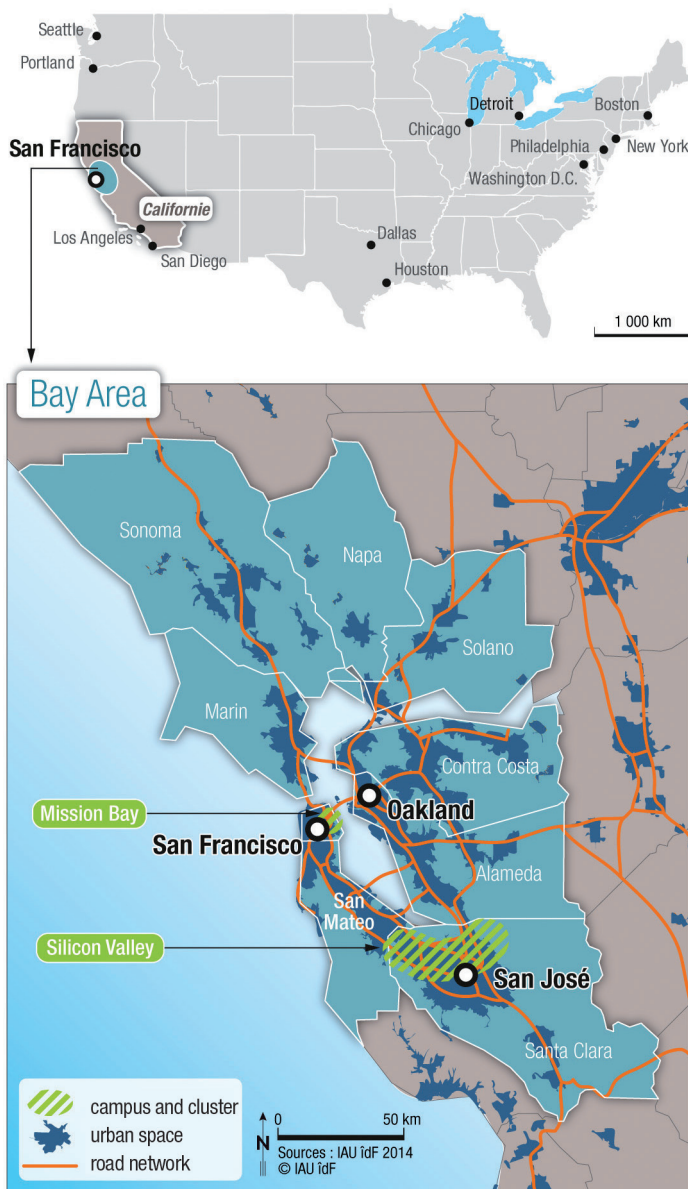
proved by the San Francisco municipality⁽¹⁾ for the construction of 6,000 housing units (1,800 "affordable"), 2,600,000 sq.ft of university and hospital space, 6,000,000 sq.ft of offices and business premises, 500,000 sq.ft of commercial space, a 500-room hotel, a few public facilities and 40 acres of green spaces.

The redevelopment plan for the zone proposed a fairly classic and logical spatial distribution of the program: in the north part, in line with the mixed neighbourhood of China Basin, and on either side of the stretch of water and Mission Creek Park, the residential, hotel and commercial part of the operation (which also included a small portion of floating homes); in the south part, the university, hospital and office part in conjunction with the former industrial and port area of Dogpatch now undergoing transformation.

The two sectors of the operation are to be, however, connected by a large green mall running east to west and a north-south road network parallel to 3rd Street, the historical artery on which the T line of the light metro runs (Muni).

Construction of the public facilities, infrastructure and public spaces has been overseen by the SFRA and the various technical agencies of the municipality and their cost (more than \$390 million) was partly funded by the contributions paid to the municipality by developers on the sale of lots (these are the Owner Participation Agreements or OPAs) and by the increase in revenue from local taxes generated by rising property values⁽²⁾. The first buildings were delivered in 2002 (Genentech Hall on the UCSF campus, Gap offices and social housing) and around thirty others followed through until the financial crisis that brought

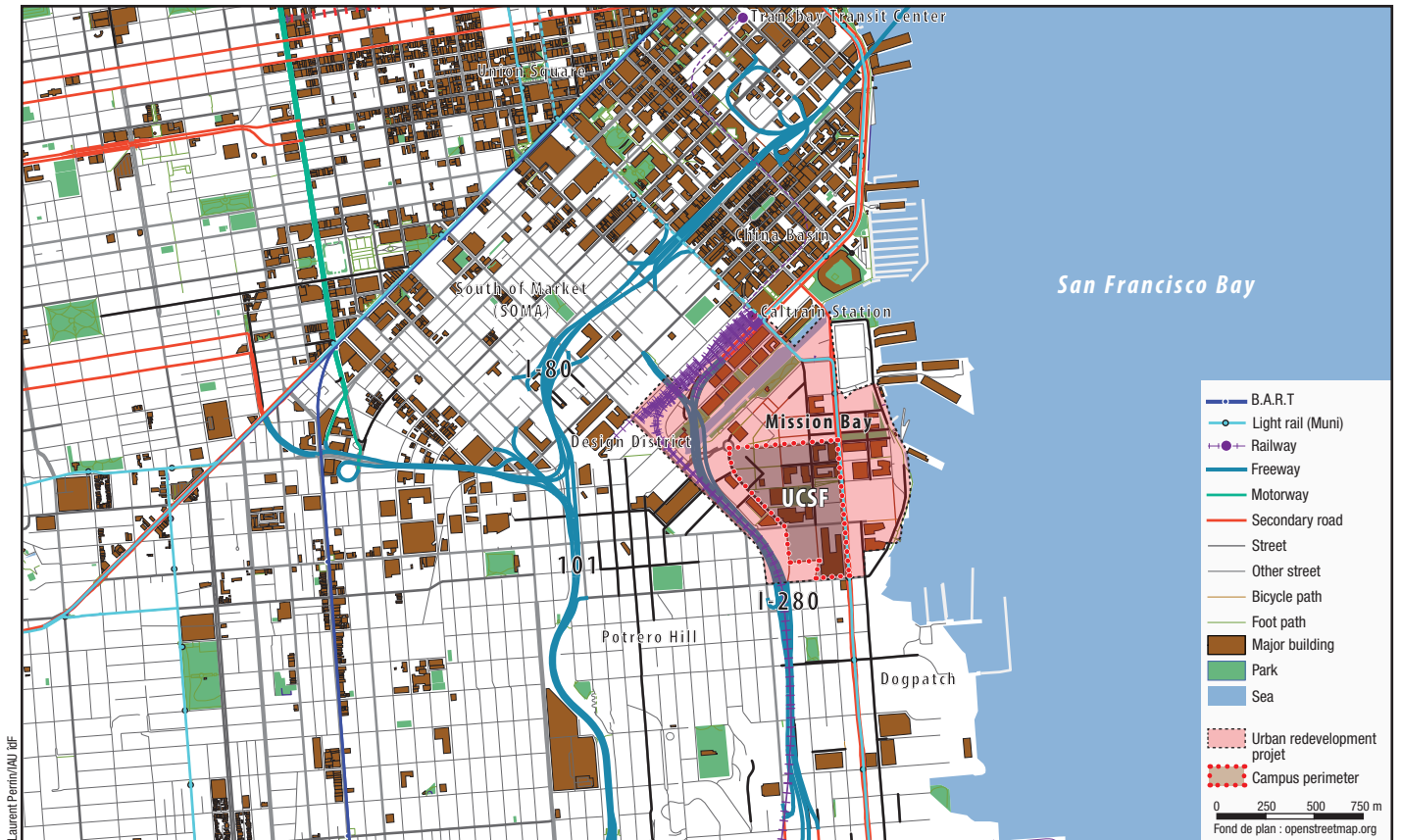
San Francisco, the Bay Area and Mission Bay in their national and regional contexts



(1) The project was led at that time by David Prowler, urban planner and former deputy mayor in the team of Mayor Willie Brown.

(2) It should be noted that UCSF, the principal occupant of the site, does not pay taxes.

Mission Bay, a campus and a cluster specialised



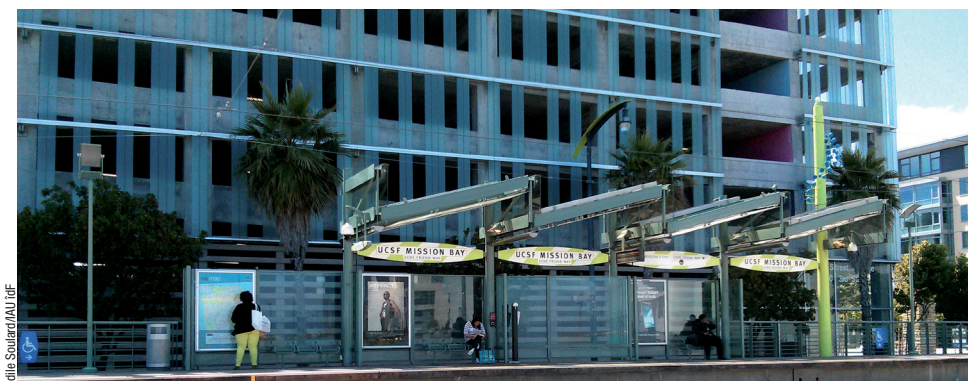
In the Bay Area, San Francisco embodies its economic development strategy by creating from North to South an «innovation corridor» combining training, research and business. Mission Bay, located in the core of this corridor, uses its central position to draw firms destined to settle in the Silicon Valley.



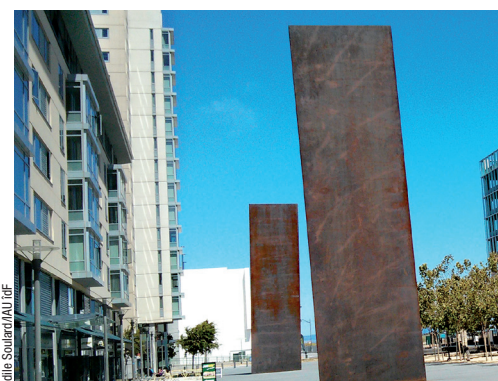
Floating homes and a public garden along Mission Creek.



Dormitory on the Mission Bay campus.



Mission Bay is well connected to downtown San Francisco and the entire metropolitan transport network.



Works of art in public spaces on the UCSF campus in Mission Bay.

ed in life sciences in the heart of San Francisco



Location of Mission bay and of UCSF's campus near the center of San Francisco. The cluster is a fine example of functions mixing and multimodal mobility.



on Bay.



Aerial view of the neighbourhoods of Potrero Hill and Mission Bay freed from the barrier formed by the I-280 overpass.

building sites to a sudden halt and caused the bankruptcy of SFRA. Construction work has only resumed for the past year or two, driven by a surge on the real estate market and the operation should be completed by around 2020.

A new frontier?

Recently, several local players supported by the Mayor of San Francisco, actively campaigned for removal of the I-280 overpass, running above the existing rail tracks and isolating Mission Bay from the adjoining neighbourhood of Potrero Hill, and its replacement by an urban boulevard at grade. To that end, they have drawn on the success of the project consisting in replacing the Embarcadero Freeway by an urban boulevard along the seafront, following the major earthquake that damaged it irreparably⁽³⁾.

It should be noted that as early as 1974, Portland (Oregon) was a pioneer in this field, demolishing the Harbor Freeway Drive for 1.5 mile in the city centre and replacing it with an urban park and an avenue running along the Willamette River. Marseille has also achieved a successful renewal in the Joliette Euromed-1 sector, by applying this same principle.

Proponents of this project even propose making the most of the high speed train's arrival as far as Transbay railway station to bury the tracks under this new boulevard and so unify the two districts, build numerous lots currently sterilised by the vicinity of the highway and create a new underground station serving the southern sector of Mission Bay. This ambitious vision could thus constitute a "new frontier" for the development of Mission Bay if the economic situation permits.

A cluster dedicated to biotechs and life sciences

The birthplace of biotechnology, the Bay Area of San Francisco now has three favoured zones for setting up clusters of life sciences and biotechnologies: Mid-Peninsula, Mission Bay and Oakland-East Bay. It ranks third among American clusters specialised in life sciences, behind the Greater Boston area and San Diego.

The University Hospital in Mission Bay

In 2015, the UCSF Medical Center & Benioff Children's Hospital will group together, in the south of Mission Bay and within a huge complex boasting a capacity of 289 beds on 860,000 sq.ft and 6 floor levels, 3 UCSF specialty hospitals which were no longer compliant with the new California earthquake standards. This large amenity is targeting LEED Gold environmental efficiency certification.

It was built according to the innovative procedure dubbed "Integrated Project Delivery" (IPD): architects, technical design & engineering firms, builders and homeowners have chosen to locate their multidisciplinary teams from thirty or so different companies in direct vicinity of the site, in the same prefabricated offices to promote exchange, acculturation and adjustment of procedures in an optimum manner.

Ten or so years have passed since its programming and more than \$1.5 billion have been spent, which reflects the magnitude and complexity of this project!

Establishing new standards of care and partnerships between fundamental research and clinical practice, it will accelerate the development of innovative diagnostic and therapeutic approaches for children, women and patients suffering from cancer, and training of the next generation of health care professionals in new tools and technologies to support teaching and learning. In addition to stem cell culture laboratories, it will include several mixed cardiology/neurology operating rooms, each covering 900 sq.ft.



Perspective of the new teaching hospital at Mission Bay.

UCSF Stantec & William McDonough + Partners

In this context, Mission Bay is attractive for several reasons: located within the administrative boundaries of the city, it backs onto the UCSF university campus⁽⁴⁾, an innovative university hospital and boasts land reserves on its outskirts (Dogpatch neighbourhoods) which can pull in businesses looking for affordable space on industrial wasteland near the centre.

The training, research and business triptych interlinks effectively and is experiencing significant momentum. The UCSF is unquestionably the driving force and its outreach, associated with the in situ presence of major players in terms of initiation and acceleration (Rock Health, the California Institute for Quantitative Biosciences/QB3, BayBio, etc.) makes it possible for many start-ups to engage with the biotechs around it. The upcoming opening of a new university hospital will further enhance the site's R&D potential by facilitating clinical trials (see boxed text on the Mission Bay Hospital).

If Mission Bay may seem modest in scale compared to the giant

of Silicon Valley, the sheer clout of UCSF and its positioning have successfully triggered a genuine cluster momentum. Over the last decade, UCSF completed the first phase of a recognised research and teaching campus and played a leading role in the creation of the cluster, where university and industry environments work together on cutting-edge research.

Many academic research programmes and facilities have been established in the University campus:

- **QB3**, Consortium of UC Berkeley, UC Santa Cruz and UCSF, is housed in the Byers Hall. A key player in the cluster, QB3 is the meeting point for academic research and the biotechnology industry. It creates both new doctorates and biotech start-ups.
- **Genentech Hall**, the first UCSF installation in Mission Bay, a research programme into structural and chemical biology as well as molecular, cell and development biology. It also houses the Institute of Molecular design, the Nikon Imaging Center and the Center for Advanced Technology.
- **The Arthur and Toni Rembe Rock Hall** hosts programmes in human genetics, develop-

mental biology, developmental neurosciences and the Center for Brain Development.

- **The Helen Diller Family Cancer Research Building** brings together scientists specialised in the basic biological mechanisms of cancer, as well as researchers in urologic oncology, paediatric oncology; population science in respect of cancer and computational biology
- **The Orthopaedic Institute** is a major centre for outpatient treatment, research and training for musculoskeletal disorders, sports medicine and injuries. This was the first UCSF clinical department at Mission Bay.
- **The Smith Cardiovascular Research Building** hosts scientists and clinicians specialised in the understanding and treatment of cardiovascular diseases. It is the headquarters of the UCSF Cardiovascular Research Institute and houses the Center for Cardiovascular Disease Prevention.

(3) See case study "Harbor Drive, Portland Oregon" by Paul Lecroart and the *Note rapide*, n° 606, October 2012.

(4) A long established university specialised in medicine and the life sciences and which runs three other campuses in San Francisco: Parnassus, Laurel Heights and Mount Zion.

- **The William J. Rutter Center** comprises a complex which houses a gym, two swimming pools, a conference centre, an activity centre, a pub and services for students.
- **The Sandler Neuroscience Center:** the centre offers leading programmes in clinical and fundamental research specialising in neurological disorders, in an environment which promotes cross-pollination of ideas and facilitates collaboration. It houses the Institute for Neurodegenerative Diseases, the Department of Neurology, the Center of the WM Keck Foundation for Integrated Neurosciences and the Memory and Aging Center.
- **The Global Health Sciences Hub:** by the end of 2014, the new building will house about 1,500 professors and staff in the Global Health programme, funded by a \$20 million grant from the Atlantic Philanthropies foundation.

The campus also endeavours to play a role as the place where the next generation of scientists, clinical researchers, doctors, nurses, pharmacists and dentists will learn thanks to the latest tools and technologies available. Today, UCSF has a daily population of 4,000 (professors and university staff, students, patients and other visitors) and this figure should rise to 9,000 after the opening of the hospital and the completion of the second phase (approximately 750,000 sq.ft yet to be built for a total of 2,600,000 sq.ft of authorised floor space). The campus also includes 430 residence units for UCSF students, postdoctoral researchers, visiting professors and their families, and a child care centre.

The UCSF's arrival in Mission Bay and its position on biotechnologies have been an economic boon for San Francisco. The development of the campus and its facilities has been an important catalyst for the biotechnology industry in the entire Bay Area. The presence of the UCSF has helped ensure that life science companies set up operations within the city boundaries: whereas Mission Bay only hosted one company when Genentech Hall first opened in 2003, it now has more than 100.

In addition to the university and the future hospital, the campus has therefore generated a cluster, "The new Digital Health Hub", a fully-fledged specialised ecosystem of more than 50 start-ups in biosciences, ten or so established pharmaceutical (Bayer, Merck, Pfizer) and biotech (Nektar Therapeutics, FibroGen) companies, plus a similar number of risk capital firms, scientific bodies such as the Gladstone Institutes, QB3, or the research centre for veterans affiliated with UCSF such as the California Institute of Regenerative Medicine (CIRM), which specialises in research into stem cells.

An expansion of the cluster to digital companies?

Seed funds and start-up accelerators are also setting up on the site, like Rockhealth in 2013, which hosts and develops companies at the interface of life sciences and digital solutions. The development of digital start-ups in adjacent areas of Mission Bay, in Soma but also further south in Dogpatch, a district that has retained industrial wasteland at moderate costs and attracts a resident population of hip-

sters, seeking proximity to the city centre, all on the same tram line (Muni T) serving Mission Bay, doubtless foreshadows a new positioning of the cluster on the "digital health" sector at the interface of engineering, biology, computer and health technologies.

A fragile success?

The almost unique positioning of the Mission Bay cluster on the biotechnology sector carries a risk in the medium term, the field being both a limited provider of jobs and highly competitive, especially in the US. The lack of commercial drive and an urban design giving rise to oversized and uniform buildings are often highlighted, even if the redevelopment of Mission Bay has made it possible for many middle class families to be housed close to the centre of San Francisco and allowed the city to hold onto companies that would otherwise have set up in the suburbs or in the Silicon Valley. The 90s urban planning that characterises the site is sometimes at odds with the expectations of today's start-ups seeking smaller places with a certain character and history, coworking spaces, creative and financially accessible living spaces, like Dogpatch or 5M in Mission⁽⁵⁾. Ultimately, the relative success of Mission Bay is down to the maintenance of its initial strategy in a fluctuating economic environment over the last 15 years and, above all, the ongoing investment of a major public player of the kind of UCSF

Laurent Perrin, Odile Soulard ■

(5) The 5M project combines arts, creative production and entrepreneurship on the same site: www.5mproject.com

For more information

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