CTE NEXT
Casa delle Tecnologie Emergenti di TORINO

CITTA' DI TORINO
*DEPARTMENT OF EU AND NATIONAL PLANNING PROJECTS – INNOVATION AREA - EUROPEAN FUNDS*

# ANNEX 4 - CTE NEXT SERVICES CATALOGUE

## INTRODUCTION

### _WHO CAN BENEFIT FROM CTE SERVICES

All **Italian and foreign start-ups and SMEs that have at least one office in Italy**, like **informal groups not yet established as a company, but intending to launch a business project**, which meet the following characteristics may benefit from CTE NEXT services

_intending **to adopt, develop, test, or launch on the market** a solution (product/service)

_enabled by **5G technology**,

_based on **at least one of the key emerging technologies** (AI, IoT, Blockchain)

_with an **expected impact in at least one of the strategic sectors** of the CTE (Smart Road, Urban Air Mobility, Industry 4.0, Innovative Urban Services).

It is not necessary to be enrolled in the innovative start-up or SMEs register in order to participate.

### _WHAT CAN CTE DO FOR THE COMPANIES

The CTE Next project makes use of a wide **network of partners** able **to support SMEs and start-ups in all phases of developing innovative solutions**, from the idea to demonstrating it in a real-world context (c.f. Figure 1).

The following are part of the **partnership** coordinated by the City of Turin: Polytechnic University of Turin, University of Turin, Fondazione LINKS, CIM 4.0, I3P, 2I3T, Digital Magics, CSI Piemonte, 5T, Fondazione Torino Wireless, Talent Garden, and TIM.

Two **methods for accessing services** are envisaged:

- via **rolling applications**, for consultancy for technology transfer, access to acceleration and training paths, which will be funded by the CTE - until the resources available for the project are exhausted;
- via **calls for proposals**, dedicated to selecting firms interested in testing in the urban environment, acceleration and open innovation programmes, which will receive funding for the implementation of their projects and/or dedicated resources from CTE NEXT.

**To be able to request a service, you must complete the registration procedure by filling in the contact form available at the link https://www.ctenext.it/#contatti.**

# SERVICES CATALOGUE - DETAILS

## _CONSULTANCY SERVICES

### _ASSISTANCE FOR ACCELERATING START-UPS

**Target:** start-ups, entrepreneurial ideas not yet set up as a company

*The start-up acceleration services involve assisting start-ups from the technical and business points of view in various stages of development: from foundation, to growth, to the scale-up phase.*

The partners involved in these services are Digital Magics, 2i3T, I3P, University of Turin, Polytechnic University of Turin.

**Type of access:** on call.

There are:

- business creation services, aimed at assisting project ideas, towards the founding of a new company, through feasibility analyses and constructing a business plan;
- "digital", "industrial", and "deep tech" acceleration services, aimed at assisting and accelerating the growth path of the innovative idea/company, providing support, consultancy, networks, and tools;
- business-model and social-impact model defining services, aimed at aiding the development of a sustainable business model - defining the economic and organisational logic with which an organisation creates, distributes, and captures value - and at assisting in assessing the social impact of the solution;
- scale-up solutions support services, aimed at developing new products/services, increasing the TRL, the presence in its segment, and the diversification across new businesses, planning and launching the technological scale-up and industrialisation, development, and acceleration of the start-up through networking and fundraising;
- real-world conditions testing support services, through assistance in defining use cases for testing innovative solutions.

**Access type:** open call

- The Acceleration Programme, promoted by Digital Magics with the support of 2i3Te I3P, aims to accelerate the growth path for start-ups that are already founded or being founded, in the PoC/MVP phase or prime traction on the market, providing investments, strategic consultancy, networks of corporate investors and tools. The programme will test the go-to-market capacity of the project with the business team, with the aim of creating, in the months following the conclusion of the acceleration programme, an investment round with the involvement of third-party investors. Each edition of the programme, of an overall length of 6 months and to which you gain access through a dedicated open call (Call4Acceleration), involves the participation of 12-15 start-ups, with training and mentorship activities, events, and periodic meetings, and participation in a final investor day.
- The ChallengebyStudents programme supports the creation of company ideas involving university students[1] in proposing and developing innovative ideas in response to challenges inherent to strategic sectors and enabled by emerging technologies. The path within the CTE involves the support of professors and mentors, both from a technical and from a business point of view, throughout the path, together with training on emerging technologies.

## _TECHNOLOGICAL TRANSFER SUPPORT

**Target** SMEs

*The technological transfer services are dedicated to SMEs to assist them in discovering and integrating research products, for the technological development of new products/services and the definition of new business models.*

The partners involved in these activities include: Polytechnic University of Turin, University of Turin, Fondazione Links, CIM 4.0, CSI Piemonte, 5T, and TIM.

**Type of access:** rolling

The technological transfer support services, which will be customised to the innovation needs of individual applicant firms, provide the laboratories and expertise of the partners for developing innovation through technical consultancy divided across CTE NEXT's key issues (emerging technologies and/or strategic sectors). These include:

- "innovation- to-business" matchmaking activities, i.e. access and presentation of a catalogue of research products, customised scouting, and one-to-one meetings aimed at assisting companies in identifying and enhancing expertise assets and important scientific research results for the development of new products/services/processes or in improving existing ones;

[1] This programme is reserved for degree course students of the Polytechnic University of Turin.

› assistance services in the feasibility analyses, technological development, and testing phases for prototypes of innovative solutions based on emerging technologies (IoT, AI, Blockchain), functionality analyses of IoT solutions in terms of cybersecurity with access to dedicated laboratories for testing, pre-commercial testing of cloud-edge services for AI applications with the possibility of accessing dedicated infrastructure (HPC4AI);

› services to support testing under real-world conditions, through assistance in defining use cases for testing innovative solutions based on emerging technologies in the CTE's strategic sectors (Smart Road, Urban Air Mobility, Industry 4.0, Innovative Urban Services), including through exploratory access to stress-test areas in the urban environment and "Digital Factory" and "Additive Manufacturing" pilot lines;

› Industrial Property diagnosis services, aimed at providing support to improve performance in managing the IP portfolio of companies, through an assessment of the knowledge level, protection, management, and enhancement of the IP;

› business model and social-impact model defining support services for new solutions (products/services/processes) based on emerging technologies;

› marketing support services, through technical and professional consultancy for creating multimedia products or streaming events using the equipment and spaces present within CTE NEXT.

## _OPEN INNOVATION SERVICES

**Target:** start-ups, SMEs

*The Open Innovation services are designed to support the growth of companies through assistance in creating open innovation challenges and evaluating innovative ideas, constructing innovative spin-offs, and demonstrating developed innovations.*

The partners involved in these activities are: City of Turin, CSI, 5T, CIM 4.0, TIM, Polytechnic University of Turin, and 2i3T.

**Type of access:** rolling

› Industrial Spin-Out service, aimed at assisting companies interested in collaborating or creating spin-offs starting from innovative projects (product/service) developed internally or in collaboration with external parties.

**Access type:** open call

› Through the Open Innovation for SMEs programme, companies (innovation seekers) may apply for challenges in the strategic sectors in response to which students from the university sector

(innovation developers) are invited to propose solutions based on emerging technologies. In order to participate in the Open Innovation programmes, the SMEs must submit their own challenges through Call4Challenges, among which the CTE partners will make a selection based on alignment with the CTE goals. In the Open Innovation paths, the SMEs, at the side of innovation developers dedicated to them, are engaged in assessing opportunities for innovation to be introduced to their business enterprise.

› Through the Open Innovation Programme start-ups may apply to develop innovative ideas and solutions that are enabled by emerging technologies in response to challenges defined by the City of Turin or by large firms. This assistance programme has the two-fold goal of offering opportunities for new collaborations to start-ups, but also of promoting the Inbound Open Innovation approach for introducing innovation into companies and the public administration. The programme involves a first assessment based on the start-up proposals (submitted through Call4Innovation) and the selection of start-ups with which to proceed in designing solutions and assisting development.

## _SUPPORT SERVICES FOR TESTING

**Target:** start-ups, SMEs

*The support services for testing innovative solutions under real-world conditions involve providing infrastructure, systems, networks, and expertise of the region to validate the "in the field" functionality, performance, and integration capacity of the solutions designed (Torino City Lab model).*

The partners involved in these activities include: the City of Turin, Fondazione Torino Wireless, Polytechnic University of Turin, University of Turin, Fondazione Links, CIM 4.0, CSI Piemonte, 5T, and TIM.

**Access type:** open call

The Urban Testing Programme is promoted by the City of Turin on the Torino City Lab model[2]. The goal is to support interested companies in co-developing and testing under real-world conditions innovative solutions (with TRL greater than or equal to 6), which use 5G at full capacity and one or more of the emerging technologies (Internet of Things, Artificial Intelligence, Blockchain) and demonstrate their validity in response to urban challenges defined by the CTE and relating to one or more strategic sectors (Smart Road, UAM, Industry 4.0, Innovative Urban Services).

The companies selected through the Call4Testing may make use of direct funding by the City of Turin, in the form of co-funding testing activities, and support services provided by the CTE partners. The following are provided for each beneficiary:

[2] https://www.torinocitylab.it/it/

- assistance in defining the use case, with the technical and scientific, managerial, and strategic consultancy of the CTE partners, activated on the basis of emerging technologies and the reference application areas for the testing proposed;
- support in testing and monitoring activities;
- evaluation of post-intervention scenarios, in terms of expected impacts, sustainability elements (environmental, economic, and social sustainability) and the analysis of opportunities for replicating the solution in other application contexts and/or fields;
- involvement in animation, communication, marketing, and scaling-up activities, including at an international level. The proposals will, in addition, be assisted in contacting the reference community as well as in communication activities, again in the context of CTE NEXT, as well as within the wider framework of Torino City Lab;
- the facilitation, assistance, and support, by the City, within the limits of its expertise and current regulations, in terms of activating all the authorisation or qualification procedures within its remit.

In addition, the parties selected may request to have:

- access to the assets provided by CTE NEXT, for the relevant aspects and functions (c.f. “Asset” section in the Services Catalogue);
- spaces for work stations and/or for events relating to the presentation of activities that are the subject of development within the CTE NEXT and/or the submission of demos for solutions developed as part of the testing (spaces to be identified, depending on the aims and until availability has been exhausted, among those provided by CTE NEXT at CSI Next, Talent Garden - Fondazione Agnelli and OGR Tech - c.f. “Spaces” section in the Services Catalogue);
- access and hospitality at the other CTE NEXT spaces, or laboratories and stress test areas (spaces to be identified, depending on the aims and until availability has been exhausted).

## _TRAINING

**Target:** start-ups, SMEs, entrepreneurial ideas not yet set up as a company

*The training and in-training services are aimed at guiding companies (entrepreneurs, managers, and operational staff) from the acquisition of knowledge about digital transition opportunities, to training in useful skills for planning and managing solutions based on emerging technologies.*

The partners involved in these activities include: University of Turin, Polytechnic University of Turin, Fondazione Links, CIM
4.0, and Talent Garden.

**Type of access:** rolling

The training services envisaged include:

- in-training workshops aimed at transferring knowledge of the digital world in 5 main areas - marketing, design, coding, data, and business - following a pragmatic and business-oriented approach, with the use of cases and project works and with the active involvement of participants. Issues discussed in the course of the workshops include: business model canvas, design thinking, digital transformation and tools, data driven strategy, agile for DT, change management, growth hacking, analytics & automation, lean mkt, content and business strategy, and storytelling.
- multidisciplinary training paths, including those customised depending on incoming diversified skills and outgoing training objectives, aimed at developing new professionals who are able to approach complex scenarios from the technological point of view, but with special attention to the synergistic integration with cross-business skills. The training activities involve: "vertical" training content offering on different emerging technologies; "horizontal" training content offering for developing economic and managerial, legal, sociological, psychological, and ergonomic skills, etc.; "on-the-job training" activities.
- higher training certified paths (academy) aimed at technical and business division managers with the goal of training individuals who are able to guide and manage the digital transformation and related re-engineering of processes, with a focus on companies operating in industrial and manufacturing sectors. The training activities involve an initial phase in which a multidisciplinary approach to the ecosystem is conveyed, a gap recovery phase (or erasure of technological skills gap), and a phase for developing systemic skills and project work to put in practice the skills acquired, resolving real problems proposed by the companies.
- individual company training paths (learning hub), aimed at growing the technological skills in a progressive manner from awareness, with introductory courses, to applied specialisation with advanced courses and complete "tailored" paths, relating to technologies for digitalising the company and additive manufacturing, on topics such as: predictive maintenance, data science, WCM, additive manufacturing, methods and tools for the digital transformation, cybersecurity, AR-VR-XReality.

**Access type:** open call

The training services envisaged include:

- online training paths (master) full immersion (6 weekend) on issues connected to CTE NEXT to do upskilling in professional skills, with a pragmatic and business-oriented approach, the use of cases and project work, and the active involvement of participants through the most innovative "learning-by-doing" methods. 60 hours of live learning sessions, 30 hours of individual study, 15 hours of project work review, and 15 late night hours are involved. Some of the masters available: Business data analysis, Business data science fundamentals, Digital transformation, Digital HR, Digital

Product Management, Growth Hacking, Digital Marketing Essentials, Growth Hacking & Digital Marketing, Content Design & Creation, and UI Design.

## _ASSETS

**Target:** start-ups, SMEs, entrepreneurial ideas not yet set up as a company

*Through the network of partners and stakeholders, for developing solutions based on emerging technologies in the strategic sectors identified and as part of the services referred to in this Catalogue, the CTE provides companies with access to assets such as infrastructure and technological devices, laboratories, and platforms, together with technical support for their use, where necessary.*

The partners who provide assets for the CTE include TIM, University of Turin, 5T, Fondazione Links, and CSI.

**Type of access:** rolling

The assets provided include:

- 5G SIMs through which to use TIM's commercial 5G mobile network to access all the normal internet services. In addition, these SIMs make it possible to access the applications configured by the testers on the CTE's MEC platform (the MEC platform is not accessible using normal, commercial SIMs) via TIM's edge solution.
- 5G devices (smartphones and COE/router) through which the users/testers may make use of the 5G infrastructure services provided by the CTE. The devices may be used with the SIMs provided by the CTE or with SIMs belonging to the testers.
- edge computing platform (ENSCONCE), on which applicant companies may install their MEC applications. CTE NEXT provides internet connectivity for the MEC node in question for any connection to internet or cloud services belonging to third parties, which are needed for applications developed and installed on the platform. The MEC platform is only accessible via 5G SIMs provided by CTE.
- cybersecurity service for each company that accesses the 5G connectivity and MEC infrastructure at CTE NEXT: protecting the traffic to and from the public internet network via Cloud Security systems (DNS Security, Secure Web Gateway, URL&App Control, Malware Protection Cloud Firewall), segmentation and local protection of application systems housed in the MEC infrastructure, secure access via VPN to the MEC infrastructure for development and remote operations.
- Yucca platform, a data hub for collecting, organising, and managing information through services and functions regarding integration, metadata, security policies, exploration, and access to information assets. The technological platform makes it possible to collect, selectively share, process in real time and display via API the data of the Internet of Things, of

social networks (Internet of People), and those produced by online application systems. Applicant companies are offered the chance to have a work area in which, using the functionalities provided by the platform's front-end, it is possible to configure smart objects and stream to acquire IoT data, to upload and download files in the CSV format, and to access data using API.

› IoT CONnectivity platform (ICON), a cloud-based and modular platform, which manages, in a unified way, the authentication and policy functions, data security, and interfacing with different forms of network connectivity, encouraging the display thereof. On the platform, via the NBIoT network, the data produced by devices/sensors of the applicant companies equipped with the SIMs provided by the CTE are collected, made available and exportable via suitable APIs.

› UTMBOX devices, to be applied on board drones and equipped with cellular connectivity, thanks to which the main data of drones in flight may be displayed, for example: their position, height, speed, route taken, or to define areas of operation in which to remain, alarms, etc. The service is used through a web interface from which the tester may manage Pilot/Operator details, create the correct areas for the flight, and supervise the tracking of its own aircraft.

› cloud resources according to the IaaS model in the HPC4AI (Research Infrastructure for High-Performance Computing for Artificial Intelligence), cloud and basic support for planning, co-design, and integration of applications based on emerging technologies and addressed to strategic sectors specific to the CTE.

› data on citizen mobility flows, including real-time traffic data (traffic, parking, ZTL, etc.), real-time DATEX II traffic events (closures, work sites, etc.), real-time predictions for public transport stop arrivals, real-time video flows, and underpass monitoring.

› Smart Road infrastructure and sensors, including Road Side Unit (RSU) V2I, traffic lights with Traffic Light Assist (TLA) system, LoRaWan infrastructure.

## _SPACES

**Target:** start-ups, SMEs, entrepreneurial ideas not yet set up as a company

### _WORK AND INTERACTION SPACES

*Work spaces, places for collaboration, networking, communication and promotion events, and for doing demos/showcases are provided to companies that develop solutions based on emerging technologies and that access the services offered by the CTE.*

The partners involved in these activities include: CSI and Talent Garden.

**Type of access:** rolling

The spaces provided by CTE NEXT are[3] (c.f. Figure 2):

- co-working workstations at CSI NEXT that can be used until available places are exhausted and up to a maximum of 5 places per company, for a maximum of 6 months;
- co-working workstations at Talent Garden, which can be used thanks to a flex membership for the use of these spaces;
- meeting, interaction, and networking areas from 6 to 10 places, at CSI NEXT;
- event, demo, and showcase spaces by reservation, in rooms with maximum capacities of 40, 50, 96, or 150 places, at CSI NEXT and at Talent Garden and OGR Tech.

### _TESTING AREAS

*Testing areas and laboratories are provided to companies developing solutions based on emerging technologies for developing PoC, for testing prototypes, and for testing solutions in real-world operating conditions.*

The partners involved in these activities include: City of Turin, 5T, CIM 4.0, Fondazione LINKS, Polytechnic University of Turin, and University of Turin.

**Type of access:** rolling

- Smart Road Circuit (c.f. Figure 3): stress test area for connected and self-driving vehicles to test solutions and services based on emerging technologies (in particular, AI and IoT) that are 5G enabled. This is a modular urban circuit of 35 km, designed so as to touch strategic nodes such as hospital and university sites, train stations and industrial plants; it is a stress test area for connected and self-driving vehicles. It comprises different types of roads: from large avenues (with and without side lanes) to smaller roads (two-way and one-way), which may comprise lanes reserved for public transport, ZTL (limited-traffic) zones, and ground-level parking and parking buildings. The outline was structured to be modular, i.e. to be able to obtain, within it, routes of different lengths and characteristics, depending on the level of self-driving system and on the use cases that are being tested.
- Drone Park – Doralab (c.f. Figure 4): stress test area for testing how suitably 5G-enabled emerging technologies may support the development of solutions and services in the field of Urban Air Mobility. Following an agreement between ENAC and the City of Turin (ENAC- PROT/114210), the DORA Park was identified for its particular features as the ideal area for an open-air laboratory where applied, "on the field" tests

[3] The capacity of the spaces may be subject to change depending on the regulations in force for social distancing. The maximum occupation length of the workstations is to be treated as indicative and may be subject to negotiation depending on the needs of the individual company and the availability of workstations in the different CTE NEXT nodes.

can be undertaken for multi-rotor drones and VTOL (Vertical Takeoff Landing). During implementation of the CTE NEXT, the testing areas for drones covered by 5G will be extended to other areas of the city that are being identified, in order to enable the flight of other types of drones (in particular, the B-VLOS-remote piloting drone) and new use cases.

› "Intelligent Factory" Pilot Lines: at CIM 4.0, two pilot lines, in the Additive Manufacturing and Digital Factory fields respectively, are available; these are configured as stress test areas for the "Intelligent Factory" solutions. The Digital Factory pilot line enables the testing of innovative, Industrial IoT solutions, which combine, inter alia, wireless sensors, cloud computing, and big data analysis, enabling new and more advanced functionalities to optimise processes and business intelligence, for example, with new AI algorithms to support predictive maintenance. The Additive Manufacturing pilot line provides technologies for printing metals via laser for developing new products, in sectors linked to the aerospace and automotive industries.

› SMART MOBILITY Laboratory: the laboratory, set up by Fondazione LINKS, has developed mixed HW-SW systems, which complete the architecture of systems adapted to vehicular communications (functional, for example, to designing self-driving and, more generally, connected vehicle services) in a configuration that involves the cloud part, the edge part, and the network edge.

› CYBER RANGE Laboratory: this is a laboratory, set up by Fondazione LINKS, for acquiring IT defence and attack skills for connected systems - IoT. In this laboratory, in virtual or mixed virtual-real environments, researchers assess the solutions developed, carry out attack and defence exercises, and companies can effectively estimate the vulnerabilities of their systems and develop the most appropriate defence solutions.

› HPC4AI-CC Laboratory: located at the HPC4AI Data Center of the Computer Science Department of the University of Turin, the "HPC4AI Compute Continuum" laboratory was set up for testing mobile technologies and is presented as a single and innovative Data Marketplace for AI. HPC4AI offers companies involved in CTE testing a "federated learning" solution that makes it possible to establishing distributed ML training networks, in which different partners share their data, thus contributing to generating shared knowledge, though these data are not, in any case, moved to a centralised location and/or away from where they are stored. The laboratory offers temporary spaces for companies interested in developing solutions, in order to enable direct contact with assets and researchers and with partners.

› CLIK Laboratory (CONTAMINATION LAB & INNOVATION KITCHEN): located within the Testing Laboratory (LADISPE) of the Department of Control and Computer Engineering of the Polytechnic University of Turin; this is a thematic laboratory where students can test and put in practice the skills they have learned based on challenges proposed by companies in an informal and collaborative environment. It is equipped with "soft" technologies for assisting fast prototyping (e.g., Raspberry Pi3 boards, Alexa software, and 3D printers for generating prototypes).

The use of the laboratory within the CTE is devised for organising events such as hackathons and fast prototyping pertaining to Technology Transfer activities according to an "Open Innovation" approach.

*N.b.:*

*The Services Catalogue is a dynamic document, the result of CTE NEXT partnership planning activities for offering support to companies. As such, it is to be understood as being constantly updated.*

*In order to stay up-to-date on any supplements and/or amendments to the Services Catalogue offering, please periodically consult the CTE NEXT website (https://www.ctenext.it).*

*The accessibility of the services listed in this document is to be verified upon companies' requests, by directly contacting CTE NEXT, which will provide detailed information on activation time frames, access methods and requirements.*

*You can contact CTE NEXT by filling in the special form available at the link https://www.ctenext.it/#contatti.*

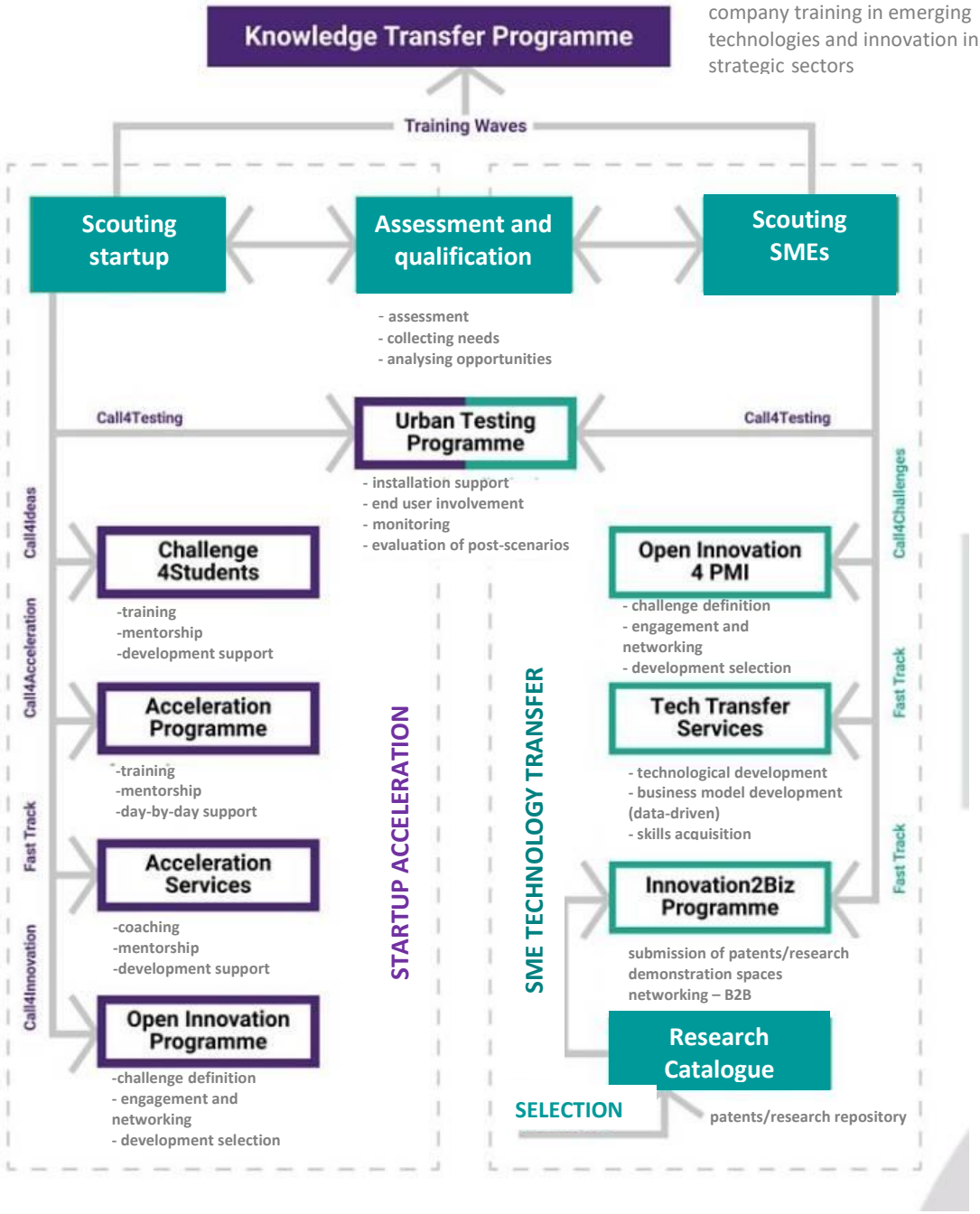
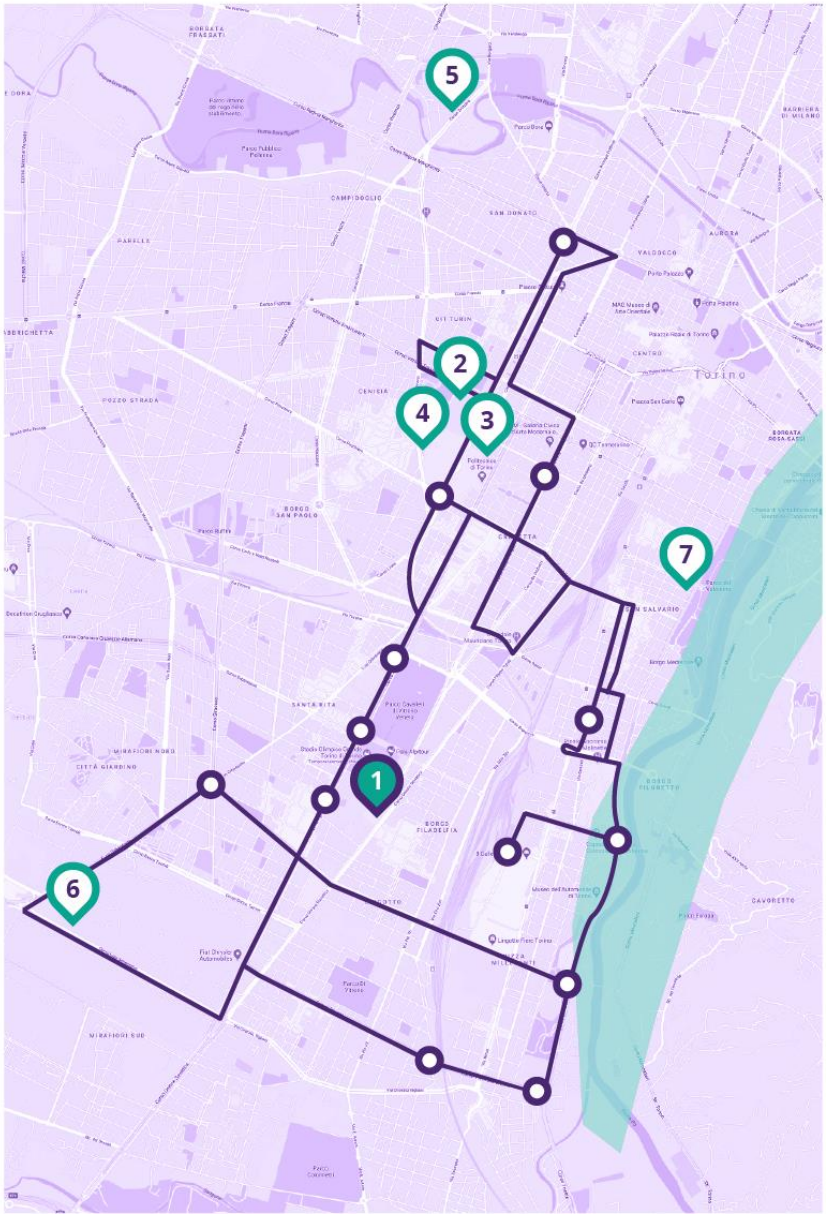



*Figure 2: Indoor and outdoor CTE NEXT nodes.*




**1 CSI NEXT**
Demonstration
Spread
Coordination

**2 OGR TECH**
Techstars
Ecosystem
Innovation

**3 POLITO**
Click Lab

**4 LINKS**
Lab:
Cyber Range
Smart Mobility

**5 UNITO**
Lab HPC4AI-CC

**6 CIM4.0**
Stress test areas
Smart Factory

**7 FONDAZIONE AGNELLI**
Coworking
Community spaces

**SMART ROAD**
Stress test areas
Innovation Mile

**AIR MOBILITY**
Stress test areas
Innovation Mile

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*Figure 3: Outline of Smart Road circuit.*


*Figure 4: Perimeter of the Doralab drone park.*