

# Job-creation through enhancing digitalisation and Smart City solutions in **LOOP CITY**

URBACT TechTown



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## Job-creation through enhancing digitalisation and Smart City solutions in LOOP CITY

### Introduction

LOOP CITY's 10 municipalities will be connected by a light rail in 2025. The light rail will not only foster improved mobility; it comes with a large potential for growth. LOOP CITY aims at enhancing that growth and ensure both urban and business development for example through facilitating and participating in projects and collaborations related to Smart City and ITS solutions and initiatives. LOOP CITY wants to take advantage of the possibilities from those various projects and initiatives throughout LOOP CITY as well as from the increased digitalisation and growth and link it to future job-creation. Therefore, LOOP CITY participates in the transnational project network *Tech Town* as part of the wider EU-programme URBACT.

The topic for TechTown is digital job-creation. Eleven cities across the EU participate and the aim is to network and share knowledge, inspirations and best practices through transnational meetings whilst producing a local action plan during the process.

Currently LOOP CITY's unemployment rate is relatively low compared to various other European mid-sized cities. However, with this project the aim is to future-proof both the demand and supply side of the ecosystem in LOOP CITY. This is done by on the one hand addressing a potential lack of digital talents, and on the other hand by shedding light on a fear that a lack of digital readiness will result in local SMVs missing future possibilities and thus job-creation. Therefore, with engaging in the URBACT TechTown project and network, LOOP CITY wants to inspire the member municipalities and enhance the framework for adapting and embracing the digital future, if the option is "to adapt or die".

LOOP CITY's focus in the project is job-creation resulting from digitalisation, skills and Smart City/ITS initiatives. Based on the inspiration and learnings during the project-period - incl. transnational meetings - the product will be learnings, network and an Integrated Action Plan. The Action Plan contains actions/initiatives to strengthen Smart City and digitalisation initiatives, which directly or indirectly will contribute to the creation of jobs and talents across LOOP CITY. The aim is to create a movement and ensure joint support to all or some of the actions across LOOP CITY's partners and external stakeholders. The actions can be implemented and turned into projects/initiatives in either the LOOP CITY setup, decentralised in one or more of the member municipalities or by an external stakeholder. Specifically the project focus will be three-fold: 1) A thematic focus on being a hub for smart city/ITS solutions, 2) To have an enabling environment for business growth and specialisation, and 3) To contribute to the talents of tomorrow – the future employees and entrepreneurs.



The action plan is based on a number of suggested actions and recommendations that allows for ongoing adjustments during and beyond the TechTown action planning process.

LOOP CITY's take on the TechTown project includes inspiration from the Sustainable Development Goals with an outset in a belief that cities can be globally responsible by acting locally. Thus, the work in TechTown supports this agenda and has the potential to contribute to a range of the goals. For example Goal 8 on Decent Work and Economic Growth, Goal 9 on Industry, Innovation and infrastructure, and Goal 17 on Partnerships. By working regionally in LOOP CITY and by sharing knowledge and best practices across Europe we can make positive changes together.

LOOP CITY is a strategic collaboration between 10 Danish suburban cities in Greater Copenhagen and The Capital Region. Thus, the way the project is planned, organised as well as the end-result reflects this unique constellation.

The TechTown project has an URBACT Local Group (ULG) with representatives from a number of LOOP CITY municipalities. Furthermore, a broader group of other LOOP CITY stakeholders has been and continues to be consulted during the project-period including LOOP CITY's board of municipal technical directors, The board of municipality chief executives (CEOs), and the board of mayors incl. the chairperson of the Region. Furthermore the process includes a number of consultations and planning meetings with external stakeholders in order to qualify the actions and secure ownership, e.g. NEXT and DOLL Living Lab.

#### URBACT Local Group

Members of the ULG-project group are:

LOOP CITY	Project Manager, Maria Cecilie Pautsch Weischer
Gladsaxe Municipality	Head of Business Development, Freja Ludvigsen
Glostrup Municipality	Business Manager, Niels Thede Schmidt-Hansen
Vallensbæk Municipality	Digitisation Consultant, Eskil Frøding & Martin Cramer Pederten
Albertslund Municipality	Project Director, Anne Marie Holt Christensen

## LOOP CITY context

### Characteristics, administration and organisation

LOOP CITY is a collaboration between 10 municipalities and the Capital Region based on a shared decision to build a light rail. LOOP CITY has a vision to enhance growth through sustainable urban and business development. The aim is to support the final decision and the construction phase as well as both to underpin and harvest the growth and development potential from the planned light rail that will connect the municipalities and strengthen mobility across Copenhagen.

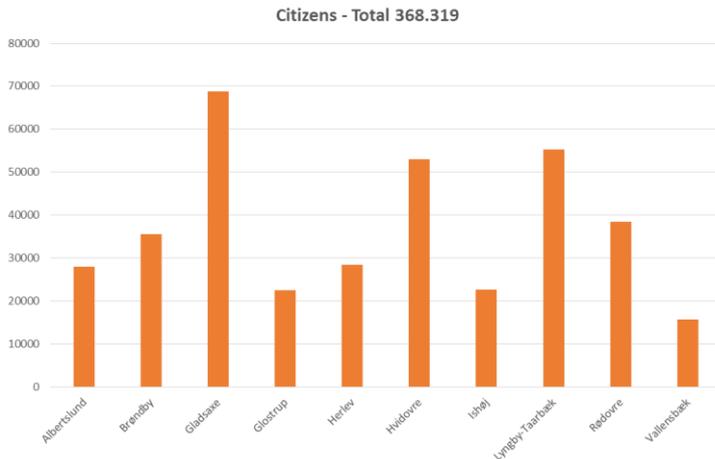
Through LOOP CITY the members gain scale and thus an ability to drive an agenda, address crosscutting issues as well as an opportunity to initiate crosscutting projects and initiatives. Local identities are strong in the municipalities, which are evident in the format of the collaboration, where both differences and commonalities are used as strengths and furthermore it makes it important to facilitate knowledge-sharing, network-structures and to avoid a one-size-fits-all approach.

The collaboration partners are the Capital Region (Region Hovedstaden) and the following municipalities of Lyngby-Taarbæk, Gladsaxe, Herlev, Rødovre, Albertslund, Glostrup, Vallensbæk, Ishøj, Brøndby, and Hvidovre.



LOOP CITY: City characteristics

The LOOP CITY area has a number of citizens totalling almost 400.000 across the 10 municipalities that varies in size.



LOOP CITY: Number of citizens

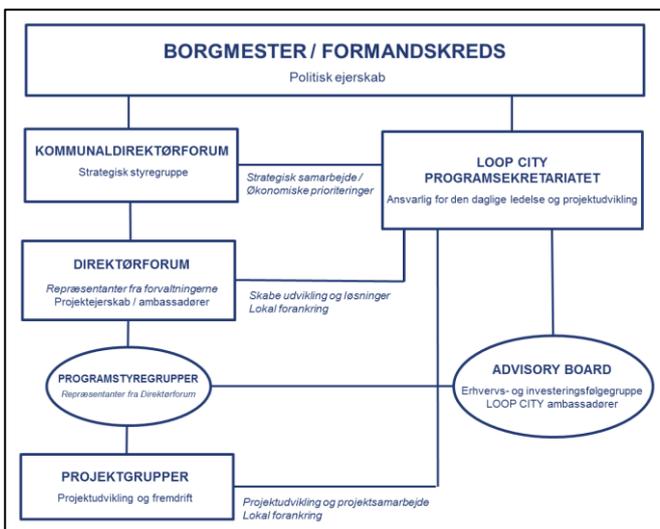
LOOP CITY is a unique Danish example of collaborative, strategic urban governance. Its goal is to realise the significant opportunities for urban and business development that the new Ring 3 infrastructure paves the way for. Through the collaboration on the agreement of the establishment of the light rail, the partners have acquired competences in a new type of decision making across municipality borders, professional boundaries and decision levels.

This structure of decision-making is a prerequisite for the ability to collaborate about a shared agenda on combining the coming light rail with Smart City solutions and digitalisation aimed at job-creation and growth.

### Governance - Organisation

The LOOP CITY secretariat manages the daily operation and project management, and provides service to chairman, the politicians and the top executive levels in the member organisations.

Besides the secretariat, LOOP CITY is governed by Direktørforum (Board of technical directors), Kommunaldirektørforum (board of municipality chief executives) and Borgmester/Formandskredsen (board of mayors and the chairman of the Region) with representatives from all 10 municipalities and the Capital Region.



LOOP CITY's governance structure and organisation

### LOOP CITY Work programme

LOOP CITY is one of Greater Copenhagen's largest contiguous development areas, and collectively boasts a large cultural and recreational offering. Seen as a whole, LOOP CITY holds the prerequisites for playing a significant role in regional and local development in the future.

The work programme for LOOP CITY aims to connect sustainable urban development, green mobility, and economic growth across the participating municipalities. It is founded on the political vision about LOOP CITY and the POLITICAL CHARTER adopted by the collaborating parties in 2012.

LOOP CITY offers visionary and intelligent solutions for sustainable urban communities where the public transport is improved and the suburbs of Copenhagen are transformed to accommodate the future urban development in Greater Copenhagen.

LOOP CITY proposes an urban corridor, which will - not only link the urban fingers of the Fingerplan that has been the plan and guiding principle for Copenhagen's mobility and urban development - but Greater Copenhagen as a whole and create a foundation for sustainable urban renewal in the Capital Region. The shared objectives of LOOP CITY are to:

- create sustainable and dynamic urban and business development along the new light rail
- improve the quality of urban life and the conditions for residential and business development throughout the corridor
- become an internationally recognised example of best practice in collaborative, strategic urban management
- attract investments
- attract passengers to public transport by focusing on the physical environment and station proximity

To reach these objectives, LOOP CITY works within the frame of three overall programmes:

Programme 1: Communication

Programme 2: Urban Development and Mobility

Programme 3: Strategic Growth

Program 1	Program 2	Program 3
Kommunikation	Byudvikling og Mobilitet	Strategisk Vækst
Strategisk Kommunikation	Smart Mobility	Digital Infrastruktur Datahub Fibermet
Konferencer mm.	TUPPAC - Testbed for selvkørende køretøjer	URBACT TechTown Jobskabelse via digitalisering og intelligente byløsninger
Videreførsel af Intensiveret Kommunikationsindsats	Bedre fysiske rammer for vækst	Bobler: Uddannelse i LOOP CITY - Talenter til anlægsfasen & til fremtidens arbejdsmarked
	Bustilpasning	Fælles Vækstskabende Initiativer (Bl.a. initiativer afledt af URBACT TechTown)
	Udvikling af knudepunkter	

Each programme has a steering group and consists of several projects amongst which URBACT TechTown is within the frame of Programme 3, Strategic Growth. The members of the steering group is listed below.

### The Steering group for Programme 3 – Strategic Growth

Morten Winge, Kommunaldirektør i Glostrup og Formand for styregruppen

Niels Carsten Bluhme, Områdedirektør i Albertslund  
 Marie Danneskiold-Samsøe, Centerchef IT og Digitalisering i Vallensbæk  
 Mads Henrik Lindberg Christiansen, Afdelingsleder & Souschef i Lyngby-Taarbæk  
 Henrik Johanson, Smart Vækst Koordinator i Region Hovedstaden

## *Network structure and the TechTown IAP*

The unique build-up of LOOP CITY is both a strength and a challenge to the TechTown project and the implication is that the project must be rolled out in another context than what we see with other project cities in the TechTown network. This means that right from the beginning the project has involved a large group of interested parties and that decisions are made by a large group of people. However, our network structure entails great potential. In LOOP CITY, we thrive with network management and expect to activate the network that is already a part of the existing LOOP CITY fora across players and interested parties.

This means that the TechTown project in LOOP CITY is carried out within a network strategy. A network strategy varies from the more traditional linear strategy by the aim of achieving effect by aligning a network of players to an overall framework. This means that in contrast to more linear planning - detail planning cannot be carried out from the beginning of a network strategy neither is it the end goal. Rather success is achieved by creating a strategic frame within which the involved parties can be a part of and deliver into. Thus, the overall framework will be the overall focus for a number of initiatives that together makes for the network strategy.

By engaging in URBACT TechTown the LOOP CITY project goal is to create such a framework that can lead to a number of initiatives in the future, where maybe only a number of potential actions are suggested by the ULG within this current project period.

The TechTown project is rooted in the LOOP CITY secretariat and closely attached to the URBACT Local Group (planning-ULG) with representatives from the municipalities Gladsaxe, Vallensbæk, Glostrup, and Albertslund. In addition, an extended group of players from the municipalities, the Capital Region and external parties are connected to the project group (Extended-ULG).

In order to ensure perspective, support and ownership across municipal borders the project manager adds TechTown-specific topics to the agendas for the meetings in Direktørforum, Kommunaldirektørforum and Borgmester/Formandskredsen (see description above), where the topic can be discussed on a consecutive basis. Members of the LOOP CITY Advisory Board can advise on an ongoing basis as well.

LOOP CITY is organised around three overall thematic programmes each containing a number of projects (see above). URBACT TechTown is within the frame of Programme 3, Strategic Growth.

The IAP has been discussed with the programme steering group in order to secure relevance and anchoring. (See below) Furthermore, if and when relevant internal or external stakeholders are identified who can and wishes to elaborate on one of the suggested actions the action will be handed over to a new governance loop.

A strategic collaboration between 10 Municipalities & the Capital Region of Denmark

Integrated Action Plan 2018

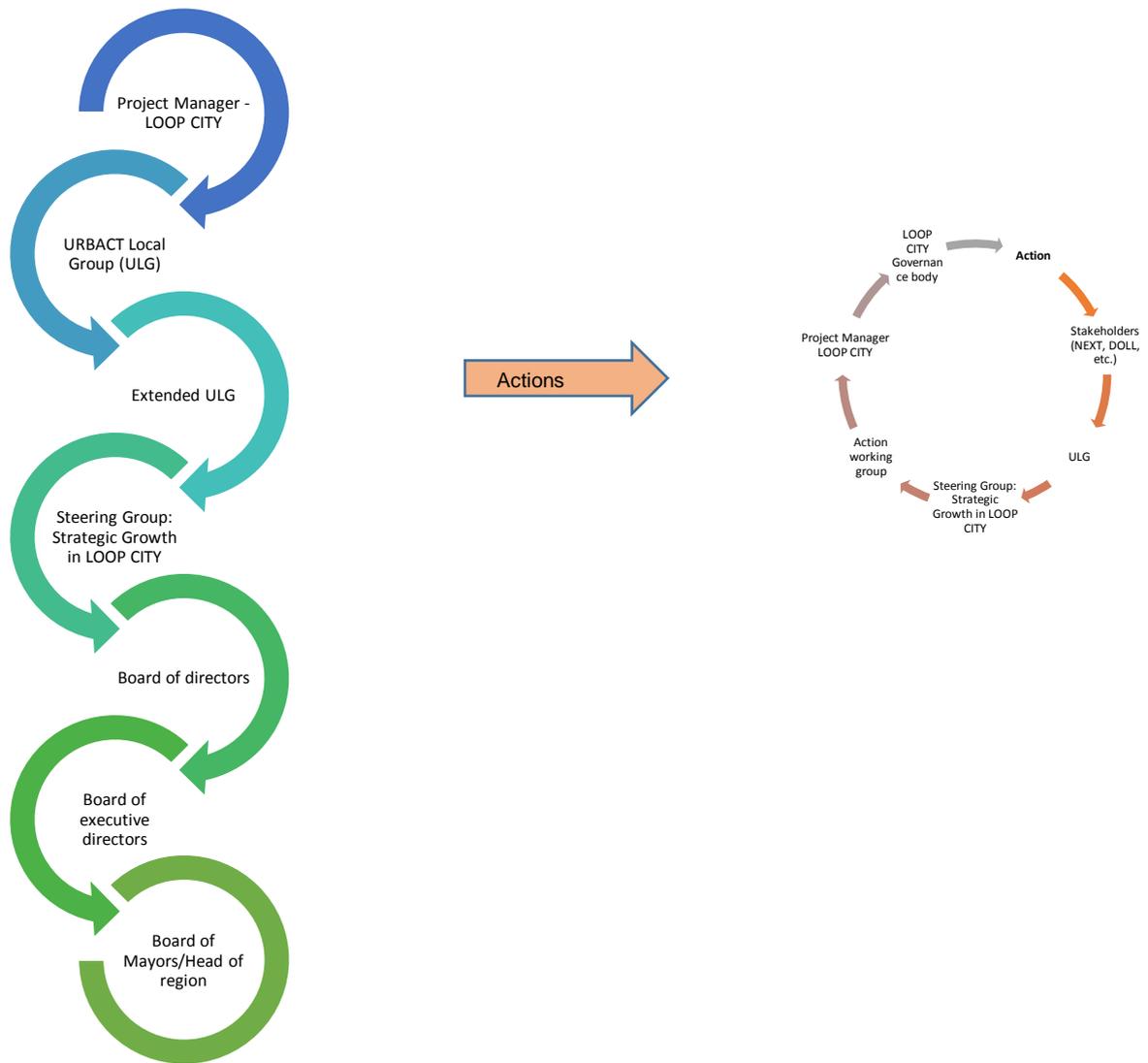


Figure: Process and governance for URBACT TechTown in LOOP CITY

## LOOP CITY Integrated Action Plan

### Vision

In 2025 when the light rail opens, the LOOP CITY area is characterized by a network of stakeholders implementing or making use of digital and technological solutions in order to enable smart city and mobility solutions. This will impact the citizens and companies in terms of improved quality of life and an interesting pool of jobs.

The LOOP CITY area will act as a large scale and real life testbed for data use and technological solutions that can enable innovation and a smart city with multimodal mobility solutions – both in the light rail construction phase and after 2025. The years of construction will be utilized to run projects with tests and use cases with a focus on data and technology in public private partnerships. In the LOOP CITY area the projects will ease transportation in the construction phase and prepare the smart multimodal mobility and city solutions for tomorrow.

I 2023/24 er LOOP CITY kendt for sit netværk af digitale aktører, der skaber og bruger intelligente byløsninger. Dette bidrager til at borgere oplever at leve i en storby med høj livskvalitet og fremtidssikrede jobs.

Virksomheder og forskere arbejder tæt sammen i LOOP CITY med at skabe innovative løsninger til den intelligente by for et globalt marked.

LOOP CITY fungerer som storskala test-bed og tilbyder åbne data på højt niveau. Anvendelsen understøttes af erhvervsfremmetilbud af høj kvalitet og fysiske mødesteder.

Mange nye jobs skabes både gennem flere iværksættervirksomheder og ved at små- og mellemstore virksomheder er vokset. LOOP CITY er et internationalt foregangseksempel på udvikling af digitale kompetencer og talenter i tæt samarbejde med uddannelsesinstitutioner fra abc til ph.d.

På baggrund af visionen ønsker vi at arbejde med det kompetencegab, der måtte være mellem arbejdskraften og virksomhedernes ønsker til medarbejdere.

Visionen er at blive Europas største sammenhængende hub for intelligente byløsninger.

### Problem frame and Problem Statement<sup>1</sup>

The light rail connects the ten municipalities in LOOP CITY physically, thus strengthening mobility and urban life. At the same time, the light rail becomes a backbone that contributes to growth in jobs and investments and boosts LOOP CITY's potential to get on the map as a hub with international positions of strength within Smart City solutions and governance.

With DOLL there is a platform for testing smart city solutions. The building of the light rail opens up the opportunity to expand the positions of strength and living lab possibilities to the full LOOP CITY area along

<sup>1</sup> We have also worked with an alternative version both reflecting on the same challenge of making local business and future talents ready to catch the digital future: "The companies need assistance to utilise data for developing new offers and services for a global market of Smart Cities. There are few or no test facilities. There is a need for places where companies, experts and users can meet and together generate progress. And there is a need for competencies – both now and in the future – to create solutions that add welfare and quality of life to the citizens and the city's users."

all of Ring 3. However, neither companies, nor municipalities or educational institutions are ready to utilise this potential in full to increase growth in the companies based on the new digital opportunities.

This leads on to the problem statement for LOOP CITY's TechTown IAP:

"Local companies foresees a future shortage of digital talents<sup>2</sup> in Denmark and LOOP CITY, and neither the companies nor the educational system in LOOP CITY is geared to meet this challenge.

In addition, many small and medium sized enterprises (SMEs) and startups find it hard to tap into the smart city agenda and seize the opportunities.<sup>3</sup>

In order to address the opportunities and meet the challenges, the TechTown project points to a lack of formalised collaboration across sectors to ensure a coordinated effort among relevant players and supporting measures for the vision of job-creation through enhancing digitalisation and Smart City solutions."<sup>4</sup>

## Specific Problems

The Project Group has identified a number of challenges that obstruct the success of the vision:

- Increased competition for qualified employees with knowledge of IT and computational thinking skills and a supply which does not match
- Vocational education is lacking behind in the digital and smart city agenda – Is not using an adequate amount of digital tools and therefore the students lack competencies for future employment.
- Not all SMEs (small and medium sized enterprises) are ready to integrate the digital opportunities
- Several companies point out that the immediate environment is not attractive to possible employees and start-ups<sup>5</sup>
- SMVs and startups within smart city solutions point to great challenges with access to capital and financing for the development of Smart City solutions both in terms of public procurement and private investments

## Area(s) of focus/priority (& rationale)

Based on the problem statement and the specific problems the ULG wishes with the TechTown Action Plan in particular to focus on the strength positions in LOOP CITY and to build upon it. Smart City solutions is a common priority for the partners in LOOP CITY. Therefore, the ULG regards these Smart City solutions as preconditions for growth, correlation and a cross-disciplinary theme for the action plan. The action plan must contribute to characterize the attractive suburb of the future for both companies, start-ups, talents and residents.

The objective of the action plan is to focus on the areas where LOOP CITY's partners as authorities can set up an enabling framework and strengthen the potential for growth. The objective of the action plan is solely to focus on the areas that can generate increased value and where possible include private players. In addition, it is important to avoid overlap with existing initiatives and to examine if there already are players and initiatives that may be included or linked to.

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<sup>2</sup> 21<sup>st</sup> century skills: [www.info.21skills.dk](http://www.info.21skills.dk)

<sup>3</sup> For example due to a lack of tools to manage and meet the digital requirements, resulting in a lack of readiness to seize the many opportunities that succeed increased digitisation. Or they need product testing facilities of scale, help to business model optimisation etc.

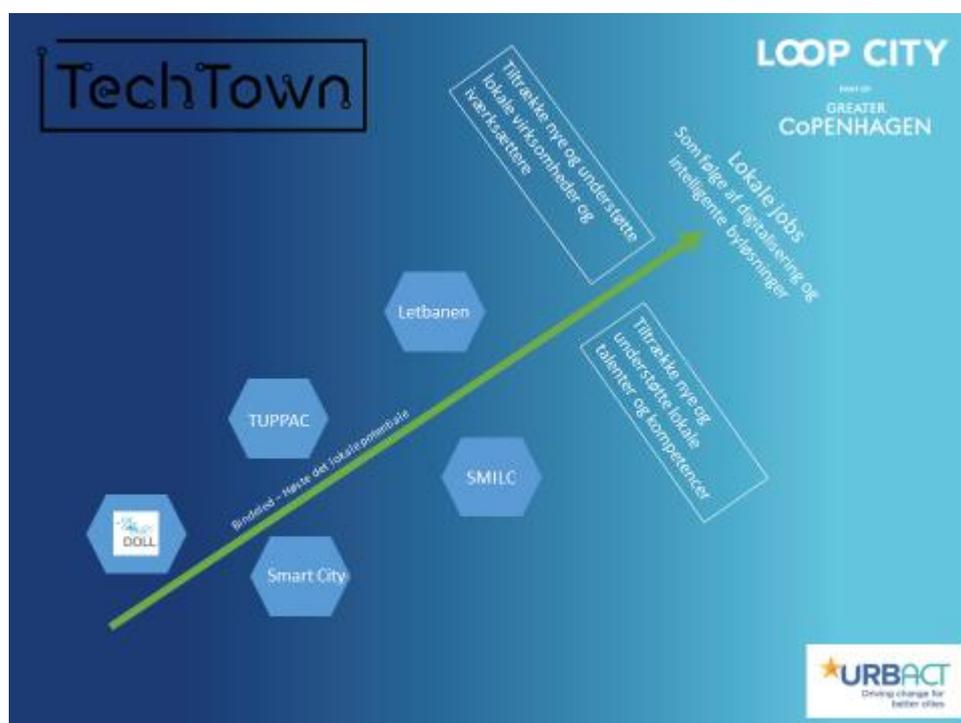
<sup>4</sup> The problem formulation has it's outset in an analysis conducted by Iris Group for LOOP CITY in 2017.

<sup>5</sup> Analysis by Iris Group

The connection between job creation and the supply of work force is particularly important, as the unemployment rate in LOOP CITY is relatively low, approximately an average of 3.9% (2015). Strengthening the correlation between companies and education is therefore of high priority in order to meet current and future supply and demand and to create a growth layer of digital start-ups with focus on Smart City solutions in the future. Therefore, there is a need for both jobs and talents.

## Specific Objectives

Hence, the specific objectives for the LOOP CITY integrated action plan all relate to enhancing our strengths based on our unique DNA based on collaborative strategic network governance between 10 cities and a region. As well as our strengths within smart city initiatives and mobility.



### Thematic

- To build on the strong focus on smart city solutions and the testbeds in Doll and DTU and turn all of LOOP CITY into a dynamic hub for sustainable Smart City solutions with a diversity of test beds. Thus, the IAP's objective is to make the Smart City agenda across LOOP CITY more explicit. Another objective is to attach the idea of the whole of LOOP CITY as an arena for possible test beds for Smart City initiatives.

### Enabling environment for business growth and specialisation

- An increase in digital start-ups particularly within Smart City solutions.
- Increase the attractiveness of LOOP CITY as a location for talents, start-ups, companies, investors from both Denmark and abroad.
- To have an improved surrounding environment and attractive "hubs" for the digital/smart city growth layer (start-ups and SMEs).

### The talents of tomorrow – the future employees and entrepreneurs

- An increase in digital and computational thinking skills across education – Specific focus on "folkeskolen" primary and secondary school and vocational training.

- More employees/talents with relevant digital competencies.
- An increase in awareness of different patterns to get or create the jobs of the future among pupils and vocational students. Eg. The option of vocational training and the option of becoming an entrepreneur.

## Actions

Based on the specific objectives LOOP CITY's TechTown Integrated Action Plan points towards a range of actions as well and a few recommendations for the future.

The Actions includes a crosscutting theme and a range of actions that can be implemented as part of the cross-disciplinary theme or as independent actions. The actions are aimed at contributing to an enabling environment for business growth and specialisation and contributing to strengthen the competencies of tomorrow's talents – the future employees and entrepreneurs.

Below there is a list of the suggested actions including the what, why, who and how. In this phase, the actions are only presented as a framework because the plan is to hand over the programming to project leads as depicted in the governance model presented above.

Action	What	Why	Who	How
<b>Crosscutting theme: LOOP CITY and the Light Rail – An attractive hub for Smart City solutions.</b>	Letter of intent/ memorandum of understanding  Build on the extensive smart city solutions, the coming light rail (mobility), the test beds, LOOP CITY datahub, TUPPAC new project for driverless, etc.	A letter of intent makes the cities focus on the Smart City agenda visible and explicit.  It can be a rack on which other actions/initiatives can be hanged on – find legitimization within.  It is a way to make LOOP CITY stand out in the green / sustainable agenda.	LC's 10 municipalities and perhaps the region  LOOP CITY sekretariat	Dialogue with the steering committee for Strategic Growth in LOOP CITY and the 3 boards of Directors, CEOs and Mayors.  Formulate LOI.  Approve within the LC governance system and sign at formal event in 2018.
<b>A living lab for light</b>  <b>This has been changed to a real life testbed for Intelligent Transport systems and solutions and smart mobility/smart city after the end of the project phase.</b>	Light (,sound) and sensors in LC.  Branding and visualise smart city solutions: The smart city coupled with strong infrastructure in the LC.  Possibly experiment with lighting of the construction phase of the Light Rail.  A "can do list" for companies allowing them to play with light and sensors on their facades/grounds.	As branding, testbed for light, theme for hackathons, involvement of local businesses, entrepreneurs, students, pupils, etc.  Creating a sense of community and togetherness across the 10 municipalities.  It attracts visitors and interest that we have bound ten cities together.  a. Communicate LOOP CITY 's digital solutions for light.  b. Use LOOP CITY's varied city structure to expand DOLL's 'test bed'.  c. Light up LOOP CITY's city belt/city structure/city environment with light solutions.	LC's 10 municipalities, the region, Doll, educational institutions.	Dialogue with the steering committee for Strategic Growth in LOOP CITY and the steering group for urban development and mobility to see if it is possible.
<b>Presentation of local companies in connection with visits by delegations - Strengthened preparedness in LOOP CITY</b>	Use a limited timeslot during delegation visits dedicated to show local products/ideas.  Visiting Package in LOOP CITY	Doll receives a number of visits per year.  There are few local or big Danish players in the smart city market - A desire to support local SMEs and startups	Doll, Copenhagen Capacity CopCap (one point entry), Invest in DK, LC's 10 municipalities, the region, Doll, LOOP CITY sekretariat, Greater Copenhagen	Continue talks with Doll, setup meeting with Copenhagen Capacity (CopCap). Setup meeting with all business development directors in the municipalities and region.

				Formulate governance structure and develop “best practice” (beredskab). Describing what to do after receiving a request for a delegation visit.
<b>Start-up environments (hubs) – Thematic (in cooperation with established companies)</b>	<p>Initiate a process for Corporate Co-working.</p> <p>Anchor knowledge locally</p> <p>Smart City and better surroundings for startups incl. support.</p>	<p>Contribute to local environments for entrepreneurs, make it attractive to settle in LOOP CITY, secure sparring and a number of interesting Smart City subcontractors.</p> <p>Engage private players (corporates)</p>	<p>LC’s 10 municipalities</p> <p>Gladsaxe has initiated a project – scale it and best practices.</p> <p>The Region - Smart Greater Copenhagen project framework</p>	<p>Gladsaxe is working with 6 larger companies to open their eyes for the mutual benefits of inviting start up’s inside – the start up’s become parts of an ambitious growth environment, and the companies get access to innovation, knowledge and talent.</p> <p>Goal: 2-3 corporate co-working spaces opens in Gladsaxe in 2018.</p> <p>Meeting with The Region regarding their Smart Greater Copenhagen project framework – They could fund the project partially.</p> <p>(We just noticed extensive interest for this field – so we are to talk with the region in order to figure out how to frame this the right way.)</p>
<b>The digital across competences, background and education</b>	<p>Pre-project initiated with NEXT and Doll: <i>Education for future growth</i> <i>- Digital competencies across background and education for growth in LOOP CITY.</i></p> <p>a. Career paths in LOOP CITY - From youth education to further education b. Campus LOOP CITY c. Young Digital and Smart City Entrepreneurs - Collaboration between Educational Institutions, Doll and others d. Internship bank - Cooperation between municipalities, companies and vocational schools to create more internships in LOOP CITY</p>	<p>To create talents for the future labor market and ensure digital skills across disciplines.</p> <p>Perhaps also a secondary focus on continuing education.</p>	<p>NEXT, other education institutions, Doll, Væksthuset, LOOP CITY secretariat</p>	<p>Close cooperation with Next and Doll.</p> <p>First draft project plan due in November.</p> <p>Ole Heinager, CEO of NEXT, to present at the Steering Group for Strategic Growth in LOOP CITY in February 2018.</p> <p>Project proposed as part of LOOP CITY work programme for 2018 at the Board of Directors on November 1.</p> <p>Decision on LOOP CITY’s 3 boards of Directors, CEOs and Mayors in March 2018.</p>
<b>Technology in schools – “HackaTeen”: Where schools and companies meet to solve specific challenges.</b>	<p>HackaTeen for “folkeskolen” primary and secondary school (pupils), youth education and vocational education, who need digital skills and computational thinking to solve cross-cutting issues and develop solutions / products / services.</p> <p>Cooperation with local businesses.</p>	<p>To create talents for the future labor market and ensure competencies across network, collaboration and digital skills.</p> <p>Ensure that education get a closer link to modern solutions and needs in the business sector. (Because the curricula can be rigid)</p>	<p>Vallensbæk Municipality to become project lead.</p> <p>LC’s 10 municipalities, LC Secretariat, school directors, NEXT and other education institutions, UU (Educational guidance for Youth), perhaps Doll, business development directors in the municipalities (and</p>	<p>Vallensbæk’s School Director has agreed to lead this project once the Letter of intent is signed.</p> <p>ULG and stakeholders to suggest a frame for a HackaTeen inspired by the experience of Barnsley and Vallensbæk.</p> <p>First Hackateen Fall/Winter 2018.</p>

	Related to smart city and eg. the crosscutting theme of light and sensors.	Secure information and knowledge of vocational education among pupils.	jobcenters). And local companies. Partnerships can depend on themes. Possibly in alliance with NGOs or the like: Coding pirates, Green Tech Challenge, TechBBQ, StartupBorgen etc.	
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A number of previously suggested Actions have been translated into suggestions or recommendations for future reference:

- Strengthen information of access to test environments and innovation projects
- Facilitating collaboration between companies and knowledge institutions
- Strengthened dialogue and communication on the municipalities' requirements and priorities for procurement
- Smart City Board in LOOP CITY (Across Municipalities and cross-disciplinary – Perhaps a supporting board of Smart Citizens)
- Smart City Fund – Risk-willing capital for smaller and isolated Smart City projects with local start-ups or companies. – Perhaps in connection with hackathons or the like.

## Measurability - Result indicators

We are in the phase of reducing the number of indicators – however at the current phase the aim is to leave room for the working groups for each action to define the specific programming.

A number of result indicators have been identified and will be elaborated more on in the ongoing work with the IAP and in the individual projects initiated through the TechTown IAP.

- Testbed - Living Labs
  - Number of tests and number of showcased products
  - Increase the knowledge of living labs – interviews may work well, but there must be a baseline and a measure of how much the knowledge must increase.
  - Number and use of living labs (number of visits/delegations)
- Visits by international delegations
  - Measure the increase in number of delegations
  - The number of companies and start-ups from LOOP CITY or their products they have been exposed to.
- Start-ups
  - Increase in the number of start-ups working with Smart City by e.g. 20 per year.
- Environments (hubs) for start-ups
  - Has the environment improved? We can examine this by interviewing the same companies in a couple of years as were interviewed in the Iris Group analysis.
  - Qualitative analysis: is it desirable for start-ups within Smart City solutions to set up office in LOOP CITY today? Then measure after a number of years.
- If applicable: Accelerator programme for start-ups and SMEs
  - One measure could be that Vaeksthus Copenhagen has specific offers and services for the target group (accelerator programme), and this may be measured by number of programmes completed. )
- Liveability – Making it attractive to live, work and start at business in LOOP CITY

- The focus should be on smart mobility solutions and how they can add value in the construction phase.
- Range of data provided
- Number of downloaded traffic apps
- Competences: digital and computational thinking
  - Measured within the field of Smart City solutions.
  - Number of pupils exposed to digital and Industry 4.0 skills
  - Number of pupils/students to consider working within the smart city field – or starting their own business.
  - Number of talents applying for Smart City jobs in LOOP CITY
  - Numbers from job centres
  - Completed competency programmes for companies and start-ups.

## Governance and resources – Organisation and administration

Based on the organisation of LOOP CITY, the ULG expects the general theme/action 1 to be approved within the framework of LOOP CITY, so that it is approved within a cross-disciplinary framework. In addition, the ULG planning group expects to include a number of interested parties such as business service players, knowledge institutions and educational institutions, companies etc. as external partners.

Initially, the ULG planning group expects to include the action plan as a range of projects or activities within LOOP CITY's programme 3: Strategic growth, which i.e. focuses on the growth and digital infrastructure in LOOP CITY. The projects are managed by the LOOP CITY secretariat and LOOP CITY partners (See the box under Actions).

There will be appointed a project group, possibly based on the existing TechTown group, which refers to the Steering Committee for Programme 3. The project group will ensure that the action plan's Letter of Intent (memorandum of understanding) is implemented across the municipalities using themed features and specific initiatives, as e.g. the specific actions proposed in the action plan or actions, which are developed in the making.

### Tech Town Taskforce

The ULG will act as consultants using their knowledge from the URBACT TechTown Network, transnational meetings and work with the IAP to support the project groups for each of the actions if relevant.

### *Budgets – financing*

The thematic part of the activities can be carried out within LOOP CITY's overall financial framework. Other of the suggested actions are presented as part of LOOP CITY's work programme for 2018 where the budgets and financing will be subjected to the overall budget framework for 2018 and some will require individual negotiations.

Potential sources of financing:

- LOOP CITY-funds
- Municipal budgets funds
- Regional budgets funds
- EU-funds/projects
- Private funds
- Other

## Selected project activities in 2017-2018

- Visit to the DOLL Living Lab in Albertslund. Introduction by DOLL to their work with Smart City solutions.
- Conference: Job creation, digitisation, and Smart City were topics discussed at the LOOP CITY conference at the Parliament, Christiansborg, on 2 June 2017.
- Gladsaxe Municipality has initiated a new initiative in which start-ups are invited to co-habit with established companies (corporate co-working).
- Meetings have been held between LOOP CITY and relevant players on strengthening the focus on digital competences (technical) among the educational institutions in LOOP CITY.
- Initial steps towards establishing a shared fiber connection and a data hub in order to enable business development across LOOP CITY.
- The project group tests the proposed activities in the action plan; the group selects the best actions and qualifies them further.
- Dialogue with the steering committee for Strategic Growth in LOOP CITY.
- Transnational Meeting in LOOP CITY in November.
- Presentation for the LOOP CITY partners in November – Participation from political and top executive level.
- Present the action plan at a LOOP CITY meeting.
- Showcase the LOOP CITY area testbed for smart mobility and ITS solutions at the ITS World Congress 2018.
- Participation in:
  - Linc (TUPPAC) project: Testbed for driverless busses in LOOP CITY.
  - The Regional Datahub project
  - Future Mobility in Greater Copenhagen project
  - Link to the City Sense real time data collection during the construction phase across the LOOP CITY area and link to the Doll Living Lab.

## Appendix 1

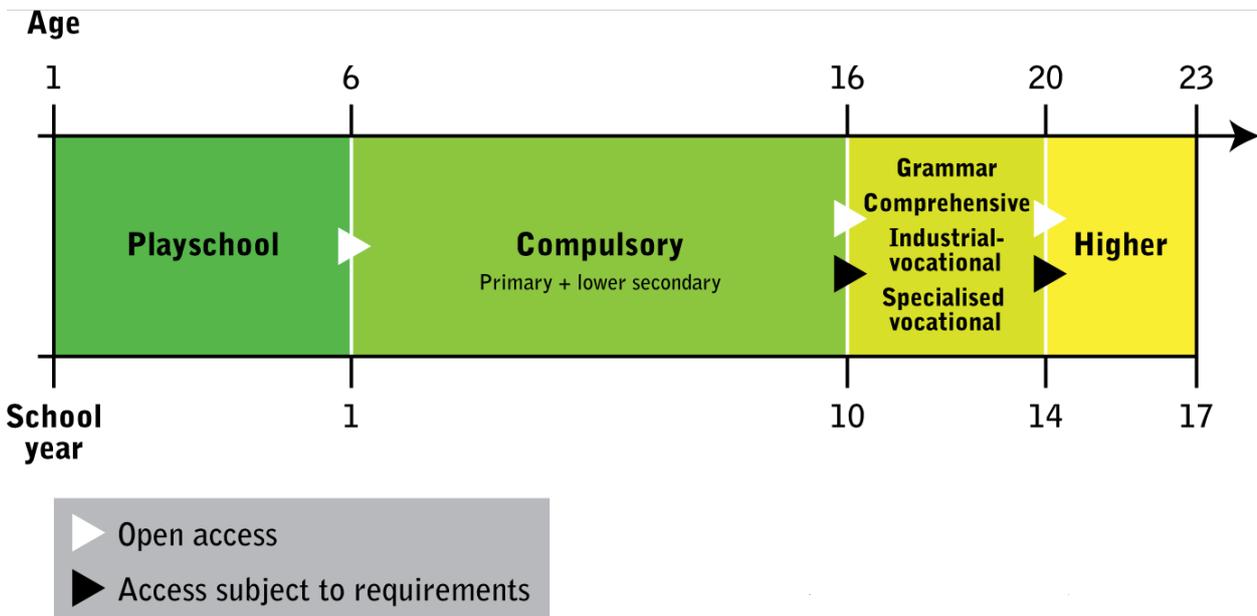
### HackaTeen: A collaborative framework in Loop City for education and businesses to solve real world problems with digital tools

Strategic growth is a common goal in everything we do in Loop City, where 10 municipalities have joined in the efforts of growing and maintaining digital skills. We emphasize on the need to grow and develop digital talents.

In recent years municipalities, schools and individuals working in education, have instigated initiatives with the purpose of strengthening digital skills among students across education. In many cases intensions have been to make a shift from merely being digital consumers to becoming digital designers and creators. Some of these initiatives have mounted into programs where students are exposed to the world of coding, programming, makerspaces and Fablabs.

The Danish Growth Council published a report in 2016 about the demand for a highly skilled workforce. Recommendations were put forward to deal with the short and long-term demand for a workforce with comprehensive digital skills. From the list of requirements, five of them were targeting the requirement for digital skills. One specifically revolved around the need to secure the foundation of education to tackle these challenges.

*“Computational Thinking must become an integrated and compulsory part of the curriculum at the relevant levels of education from Compulsory education and up to higher education (age 6 to 23), as well as post education and training programs. It is crucial that a sufficient level of digital and analytical skills is present among educators across all levels of education.” (The Danish Growth Council, 2016)*



Computational thinking is a concept for problem solving. It is a methodology for understanding complex problems and developing solutions for them. These solutions are then presented in ways that humans, computers, or both can comprehend.

In the following section some fundamental concepts of computational thinking will be explained.

- Decomposition – This refers to breaking down a complex problem into smaller parts that one will be able to solve one by one.
- Pattern recognition – This refers to the exercise of scouting for patterns or something uniform within the problem.
- Abstraction – This is the ability to focus on relevant information and ignore irrelevant details.
- Algorithms – This is the ability to develop incremental solutions to a problem – or setting up rules to follow in order to solve a problem

Municipalities across Loop City are determined to develop and grow digital skills among its pupils/students, especially within the field of problem solving and computational thinking. This is why we set out to arrange Hackateens across Loop City.

A Hackateen is an event where students in small groups compete against one another to solve real world problems, often with the assistance of cutting edge technology. Computational thinking, creativity and innovation are all central to the task a problem solving during Hackateens. Local businesses may provide their real-world problems that they wish to be solved. University students may be tutoring groups and give hints and ideas along the way in order to keep creativity and innovation flowing.

Hackateens in Loop City is a long-term effort to grow and maintain digital skills in the work force. Long-term efforts are in high demand everywhere, as there are no quick fixes to combat the future shortage of digital skills in the labour market.

## Appendix 2

### **Education and 21<sup>st</sup> century skills in LOOP CITY**

The Action – project description is attached

## Appendix 3

### The LOOP CITY area as a testbed for smart city and intelligent mobility (ITS)

The infographic features a dark blue background with white text and icons. At the top, the 'LOOP CITY' logo is prominently displayed in large white letters. To its right, the text 'PART OF GREATER COPENHAGEN' is shown, along with the logo for 'The Capital Region of Denmark'. Below the main title, a row of ten municipal coats of arms is presented, each with its name underneath: Albertslund, Brøndby, Gladsaxe, Glostrup, Herlev, Hvidovre, Ishøj, Lyngby-Tårnby, Rødovre, and Vallensbæk. The central part of the infographic contains four white circles, each containing a key project detail. At the bottom, a stylized illustration of a light rail train is shown against a lighter blue background. The website address 'www.loopcity.dk' is located in the bottom right corner of the infographic area.

# LOOP CITY

PART OF  
GREATER  
COPENHAGEN

REGION  
H The Capital Region  
of Denmark

Albertslund Municipality  
Brøndby Municipality  
Gladsaxe Municipality  
Glostrup Municipality  
Herlev Municipality  
Hvidovre Municipality  
Ishøj Municipality  
Lyngby-Tårnby Municipality  
Rødovre Municipality  
Vallensbæk Municipality

LOOP CITY is a strategic collaboration between The Capital Region of Denmark and 10 Danish municipalities with 370.000 citizens all together

The collaboration crosses administrative borders to pave the way for new and smarter solutions focusing on intelligent mobility and urban and business development

The 10 municipalities surrounding Copenhagen will be connected by a light rail in 2025 with an estimated 14 million annual passengers

With the new infrastructure as a backbone LOOP CITY will be a large-scale testbed for data driven mobility solutions in Greater Copenhagen

[www.loopcity.dk](http://www.loopcity.dk)

The Greater Copenhagen Light Rail

**LOOP CITY**  
Large scale testbed for smart mobility and accessibility across administrative borders

**THE REGIONAL DATA HUB**  
Combining data from across administrative borders to support smart mobility, traffic management and climate protection

**LINC**  
Testing autonomous first mile - last mile service connection to the light rail  
EUROPEAN UNION | UIA

**COWI CITY SENSE™**  
Collecting traffic data in real time across LOOP CITY - Supporting traffic flows in the construction phase of the light rail

**DOLL**  
Lighting the future of smart cities  
Europe's leading living lab for intelligent outdoor lighting and Smart City-services

**FUTURE INTELLIGENT MOBILITY**  
at ØSTERFORSKOV  
Multimodal mobility hubs for the future  
inverreg | ØSTERFORSKOV

**LOOP CITY**  
Copenhagen Municipality  
Greater Copenhagen Area

The Greater Copenhagen Light Rail



Showcased at the ITS World Congress 2018

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## Appendix 4

### Background information on the LOOP CITY area

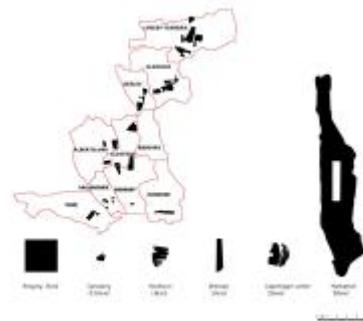
#### Light rail

Read more: [www.dinletbane.dk/in-english/](http://www.dinletbane.dk/in-english/)



#### Facts

- 28 km long, 29 stations
- 5 minute operation daytime weekdays
- 13-14 million passengers pr. year
- Construction: 2018-2024
- Expected:*
- Generated investments: 32 mia. dk/kr
- 36.500 new jobs + 32.000 new citizens



#### Geography and accessibility

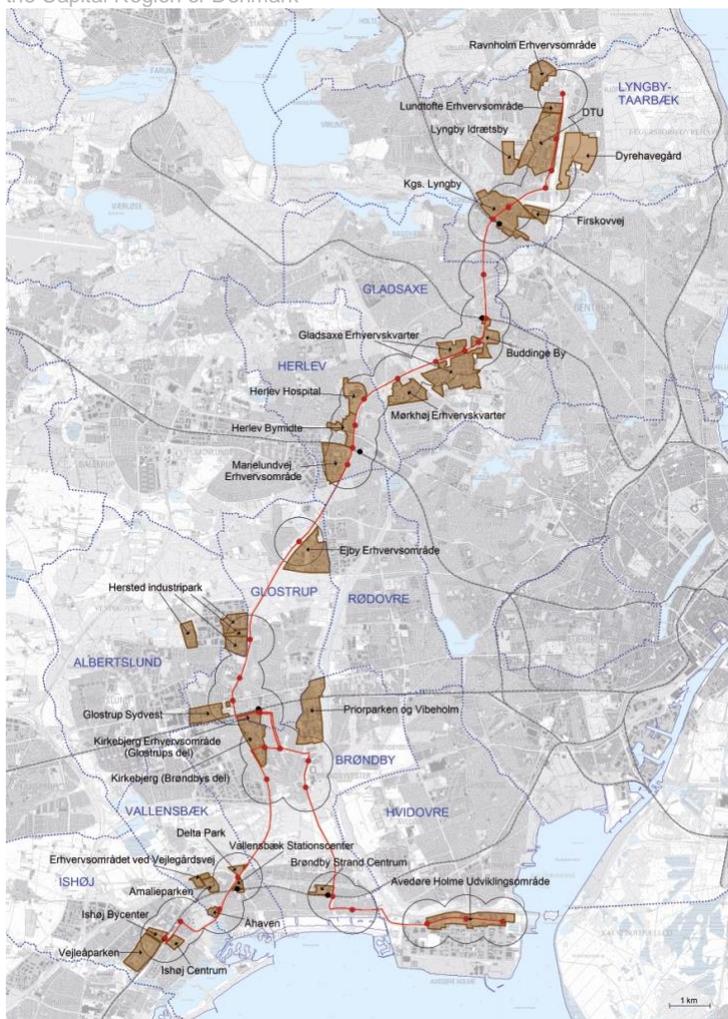
LOOP CITY covers 10 suburban towns in a half ring around Copenhagen.

Characteristic of LOOP CITY is the long ring road, Ring 3, which joins Lyngby-Taarbæk to the north with Ishøj to the south. Besides, there are crossing and express busses and S-trains connecting the cities in LOOP CITY to Copenhagen and the surrounding municipalities.

*Below: Map of the LOOP CITY area. The brown areas shows the business districts.*

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## Demography<sup>6</sup>

The LOOP CITY towns are characterised by a very broad span in connection to both the composition of citizens and business. See the appendix for more data for the 10 municipalities in LOOP CITY.

The socio economic data across LOOP CITY varies with differences in level of education, number of persons of other ethnic origins as well as work status.

By January 2017, the number of citizens totalled 368,319 across the ten LOOP CITY municipalities.

Folketal 1. januar efter byer og tid		
Enhed: antal		
	2017	I procent 2
153-00153 Brøndby Kommune	35.594	9,7%
159-00159 Gladsaxe Kommune	68.775	18,7%
161-00161 Glostrup Kommune	22.528	6,1%
163-00163 Herlev Kommune	28.406	7,7%
165-00165 Albertslund Kommune	27.896	7,6%
167-00167 Hvidovre Kommune	52.964	14,4%
173-00173 Lyngby-Taarbæk Kommune	55.240	15,0%
175-00175 Rødovre Kommune	38.492	10,5%
183-00183 Ishøj Kommune	22.719	6,2%
187-00187 Vallensbæk Kommune	15.705	4,3%
<b>Total</b>	<b>368.319</b>	<b>100%</b>

<sup>6</sup> This is a shortened version of the data. Kilde Danmarks Statistik. See also the data appendix that will be elaborated further on this part in the next version of the IAP.

## Unemployment

In 2015, the average unemployment across the 10 municipalities was approx. 3.9%.<sup>7</sup>

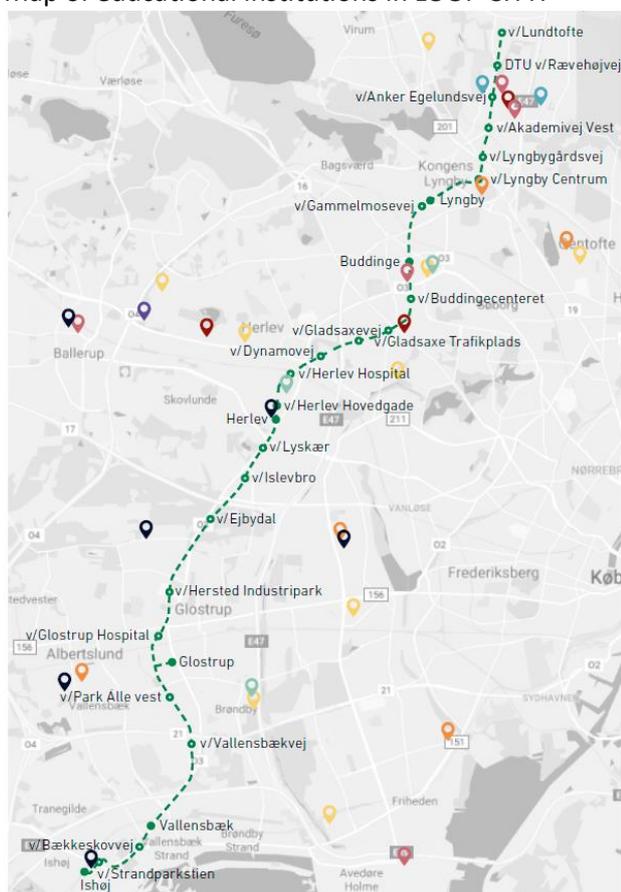
According to the latest calculations from Statistics Denmark 98% of the population have access to internet in their homes in the Capital Region where LOOP CITY is situated. 95% have access to a computer in their homes.

## Education

(The Danish Education system are summarised above – In the appendix describing the action HackaTeen)

LOOP CITY has a wide range of educational providers on all levels from primary education to vocational training and universities. The Danish Technical University is located in LOOP CITY.

### Map of educational institutions in LOOP CITY:



-  NEXT Uddannelse København
-  TEC
-  Knord
-  SOSU
-  Gymnasier
-  VUC & HF
-  DTU
-  Kea
-  Loop City

## Educational level

<sup>7</sup> Økonomi- og Indenrigsministeriets Kommunale Nøgletal

Befolkningens højeste fuldførte uddannelse (15-69 år) efter tid, højeste fuldførte uddannelse og bopælsområde - 2017

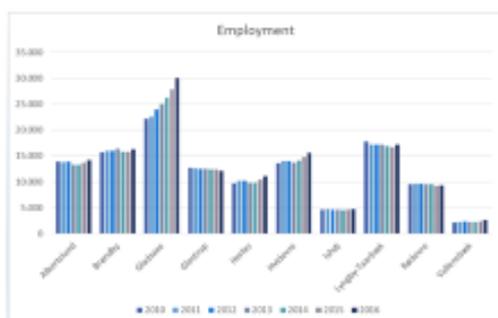
	Albertslund	Brøndby	Gladsaxe	Glostrup	Herlev	Hvidovre	Ishøj	Lyngby-Taarbæk	Rødovre	Vallensbæk	Total	Procent
H10 Grundskole	6.184	8.131	10.808	4.054	5.172	9.997	5.506	6.464	7.028	2.356	65.700	27,82%
H20 Gymnasiale uddannelser	2.044	2.246	5.054	1.447	1.863	3.552	1.425	4.381	2.461	1.022	25.495	10,79%
H30 Erhvervsfaglige uddannelser	4.930	7.373	11.675	5.222	5.932	11.578	4.619	6.530	8.281	3.314	69.454	29,40%
H35 Adgangsgivende uddannelsesforløb	18	17	48	11	21	23	11	17	16	15	197	0,08%
H40 Korte videregående uddannelser, KVV	809	1.040	2.147	783	937	1.761	626	1.582	1.162	581	11.428	4,84%
H50 Mellemlange videregående uddannelser, MVU	2.603	2.371	6.769	1.788	2.570	4.271	1.344	5.715	3.345	1.253	32.029	13,56%
H60 Bacheloruddannelser, BACH	327	353	1.077	250	280	704	219	1.256	484	181	5.131	2,17%
H70 Lange videregående uddannelser, LVU	1.109	1.065	5.933	934	1.428	2.555	626	7.845	2.001	812	24.308	10,29%
H80 Ph.d. og forskeruddannelser	73	55	740	64	156	163	35	947	176	48	2.457	1,04%
H90 Uoplyst mv.	1.298	1.888	3.757	1.046	951	2.239	1.651	2.820	1.509	839	17.998	
<b>Total</b>	<b>19.395</b>	<b>24.539</b>	<b>48.008</b>	<b>15.599</b>	<b>19.310</b>	<b>36.843</b>	<b>16.062</b>	<b>37.557</b>	<b>26.463</b>	<b>10.421</b>	<b>254.197</b>	
Total minus Uoplyst	18.097	22.651	44.251	14.553	18.359	34.604	14.411	34.737	24.954	9.582	236.199	100%

## Business Sector and services

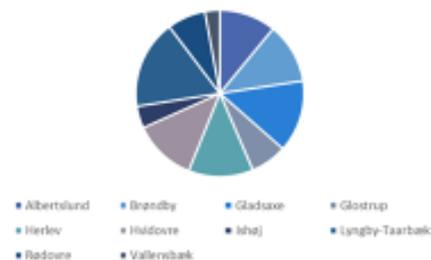
### Business in LOOP CITY – Characteristics

LOOP CITY has a broad variety of companies in terms of both size, contribution to growth and lines of business. (See data set)

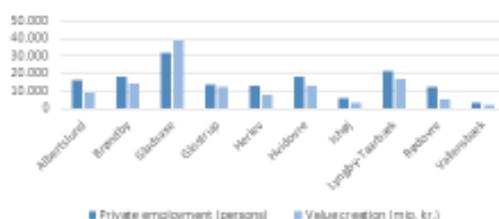
### Growth in the 10 LOOP CITY municipalities



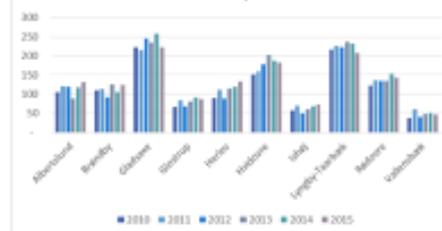
### Exporting companies 2015



### Private employment and value creation in LOOP CITY 2015



### New companies



### Business Service

The focus on business development and business service varies in the 10 municipalities. However, the 10 municipalities have a high degree of collaboration on business service, which the project can utilise and benefit from.

Selected actors:

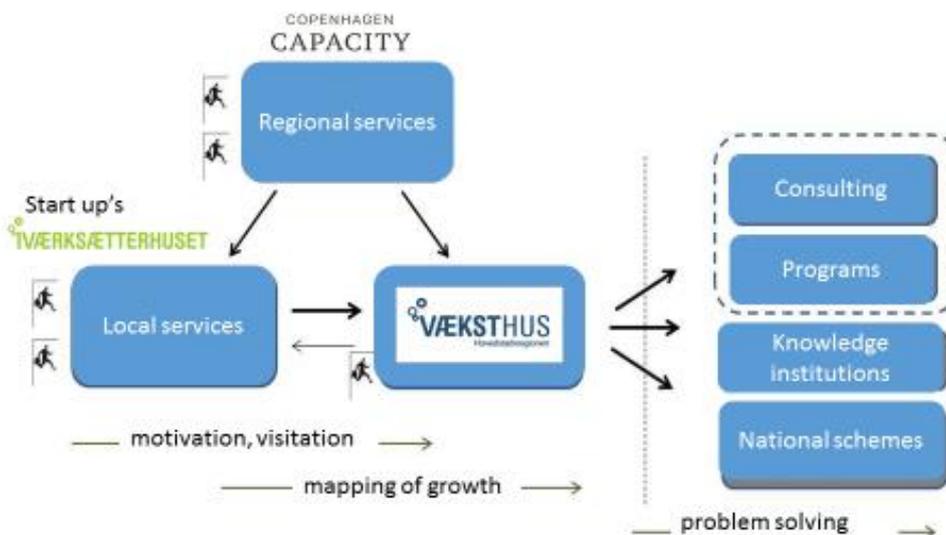
- Local municipal business service
- Iværksætterhuset (StartUp House)
- Væksthus Hovedstaden (Growth House for SMEs)

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- Cph EU Office
- Copenhagen Capacity

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## Business services for growth business in LOOP City (and the rest of the region)



### Digital economy

Denmark ranks top in the EU for digitalisation. 98% has internet access at home. E-government is standard.

### Smart City

DOLL (Danish Outdoor Lighting Lab)<sup>8</sup> is a permanent platform bringing players within outdoor lighting and Smart City solutions together to create innovative new solutions and to invite municipalities into the new, smart world in Europe's largest living lab.

<sup>8</sup> DOLL is a permanent platform that brings together players in outdoor lighting and Smart City solutions to create innovative new solutions and offer municipalities a look inside the new, smart world of Europe's largest living laboratory.

The vision is for DOLL to be the world's leading innovation hub to develop, test and demonstrate intelligent lighting and Smart City solutions. The mission is to enable decision makers in the public and private sectors to choose the most optimal, innovative lighting and Smart City Solutions and for private companies to develop, test and demonstrate the future of intelligent lighting and Smart City Solutions.

The backbone of DOLL is intelligent outdoor LED lighting. New LED technology, combined with intelligent control, can provide municipalities with energy savings of between 50-80 percent. But at the same time, the outdoor lampposts are an ingenious infrastructure of the smart city. An infrastructure that can form the basis for the integration of Smart City technology, sensors and new communication platforms (Smart Urban Services). DOLL Living Lab, one of three laboratories in DOLL, is situated in Albertslund, right to one of LOOP CITY's coming light rail stations. Here is where lighting solutions and smart urban services are being tested 1:1.