

The European Commission's  
**INTELLIGENT CITIES  
CHALLENGE**

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# Gelsenkirchen: Intelligent City Transformation Overview

ICC Final Deliverable

# Executive summary

Gelsenkirchen is a city with 265,000 inhabitants embedded in a dense urban network: the city of Gelsenkirchen is located in the heart of the Ruhr region, Germany's largest metropolitan area with over five million inhabitants. In Gelsenkirchen, all digitization steps take place under the guiding principle of a "Connected City".

In the "Connected City Gelsenkirchen", digitization should be a key driver not only for economic growth, but also for social and participatory urban development. Gelsenkirchen was an early adopter of digitization, as evidenced in particular by the expansion of the fiber-optic network, which the municipal company GELSEN-NET has driven forward for decades. GELSEN-NET has also set up over 500 hotspots with free WiFi citywide, including in both city centers (old town and second city centre in the district Buer) . The expansion of free W-LAN in buses and streetcars is also very advanced. In addition, the city of Gelsenkirchen has already developed a wide range of digital applications, ranging from a municipal infrastructure database to a geo-data service, edutainment offerings in the ZOOM adventure world, and the introduction of an open-data platform on which all urban data will converge and be linked with each other.

In addition, Gelsenkirchen was able to gain a lot of important experience as the lead municipality in the „Digital Model Regions NRW“ and other funding programs.

As part of the ICC programme, the City of Gelsenkirchen selected 7 projects/initiatives that were already in the planning stage. Challenges arose - as probably with many other cities - due to the pandemic. Due to it, Gelsenkirchen had to reprioritize and overcome capacity constraints. Nevertheless, the projects benefited greatly from the ICC programme and the exchange with other municipalities. In the next 3 years, the measures will be further developed by the German Federal Ministry of the Interior and Home Affairs (BMI) as part of the Model Projects Smart Cities funding program.

# The city of Gelsenkirchen pursued an EU-supported transformation over four main stages, and this document details that journey

Overview to the city's journey and structure of this document



## 1 Preparation & assessment

5 months:  
September 2020 – January 2021



## 2 Ambition & roadmap

3 months:  
February 2021 – April 2021



## 3 Implementation

15 months  
May 2021 – July 2022



## 4 Review & way forward

2 months  
August 2022 – September 2022

*Reported as  
one section*

### Summary

Find out **where a city is, where it should go** and who in the ecosystem is going to **mobilise and make things happen**

Develop a **concrete plan** to achieve **measured improvements**, collaborating with the community; push action with immediate benefits

Get “big things” **done** and **see results**; take **action in partnership** with others

Measure success, and commit to **keep connections and improvements going**

Section

1

September 2020 to January  
2021

# Gelsenkirchen: Preparation and assessment

ICC transformation



# Introduction

Cities and regions today face ever greater challenges due to the rapid technological development brought about by digitization and against a background of ecological and socio-economic changes. This concerns sustainable and future-proof urban development and the associated delivery of municipal services for all stakeholders in an urban society.

Our city responded to these challenges early on, addressing them both as opportunities for development and to remove possible development obstacles.

The integrated strategy (which was a result of the DCC) for the Connected City of Gelsenkirchen provides the framework for our city's sustainable, social and participatory development. The objectives are to secure and increase citizens' quality of life and prosperity and a future-oriented and competitive economy.

# City needs: State of the city overview

## The state of Gelsenkirchen today

We have been working collaboratively and intensively on topics of digital urban development in Gelsenkirchen in cooperation with citizens, the city administration, municipal subsidiaries, and partners from economy and science since 2014. This makes us one of the most pioneering cities in North Rhine-Westphalia and Germany in general.

A major driving force behind this development was also the early adaptation in our city of the goals and measures presented by the European Commission on May 6, 2015 as part of the Digital Single Market Strategy for Europe.

## Key insights from city performance analysis

### Higher performance observed

**1** The creation of 1,000 jobs subject to social insurance contributions per year (till covid19)

**2** Digitization as a focus

**3** Networks between the city, university, business and associations

**4** High identification with own city (young people who want to stay in the city and improve it)

**5** Successful urban redevelopment

### Lower performance observed

**1** High unemployment rate

**2** skillset mismatches skills needed in the digital society

**3** High quota of transfer beneficiaries

**4** High child poverty and educational underachievement

**...** Participation of immigrants

# City ecosystem

## Alternative for the City Ecosystem: Facts and Figures



**~265,000**  
Inhabitants in 2020



**22**  
Social media channels



**15 of 15**  
Industrial area connected with  
fibre internet



**93 %**  
of inhabitants are connected with  
50 Mbit/s



**86**  
Schools are connected to fibre  
internet



**129**  
Nationalities are present

# Strategy Model of the Connected City Gelsenkirchen

This is how we want to realise our vision.

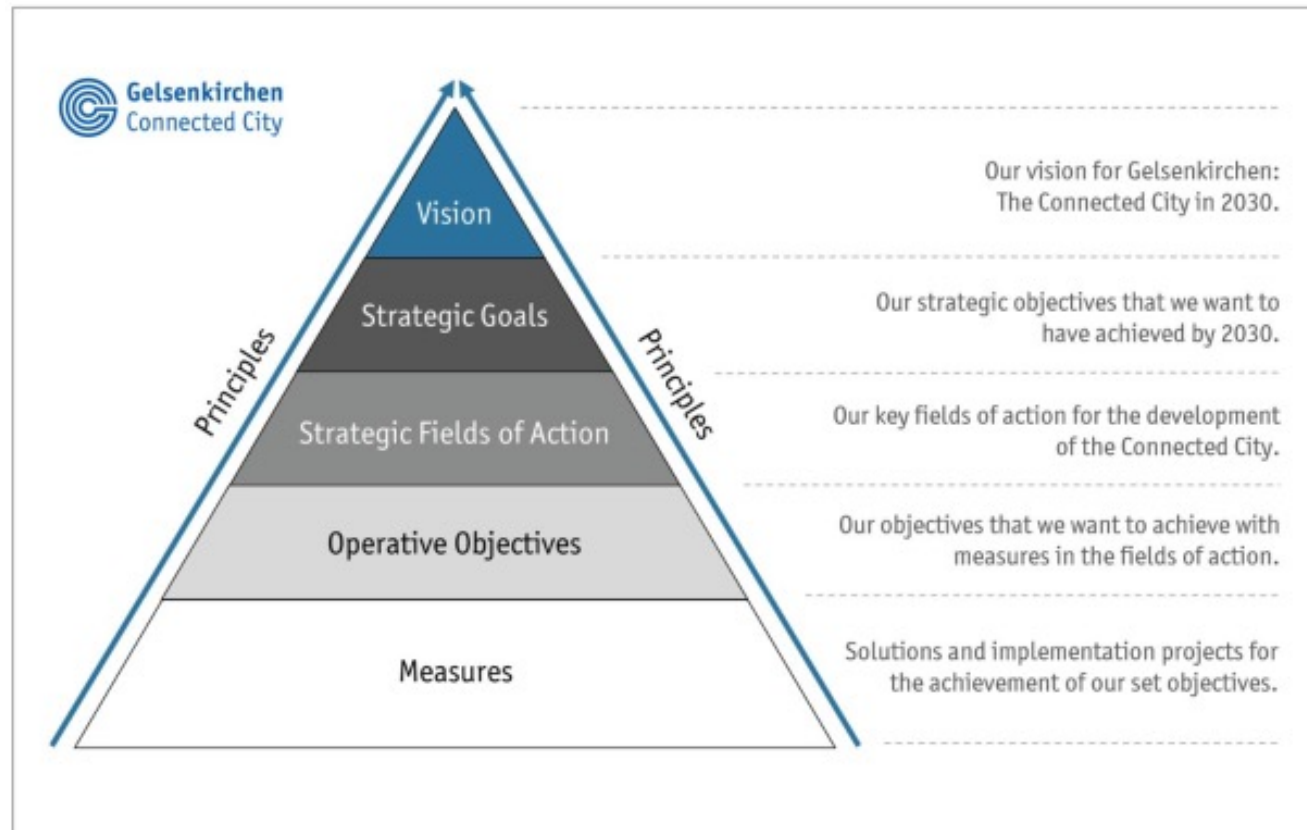


Figure 3-1: Strategy Model of the Connected City Gelsenkirchen



# ICC strategy: Vision and ambition statements

Our integrated digitization strategy includes several “Guiding Themes” which include several ambition statements.

Each “Guiding Theme” focus individual directions/ dimensions of a smart city.

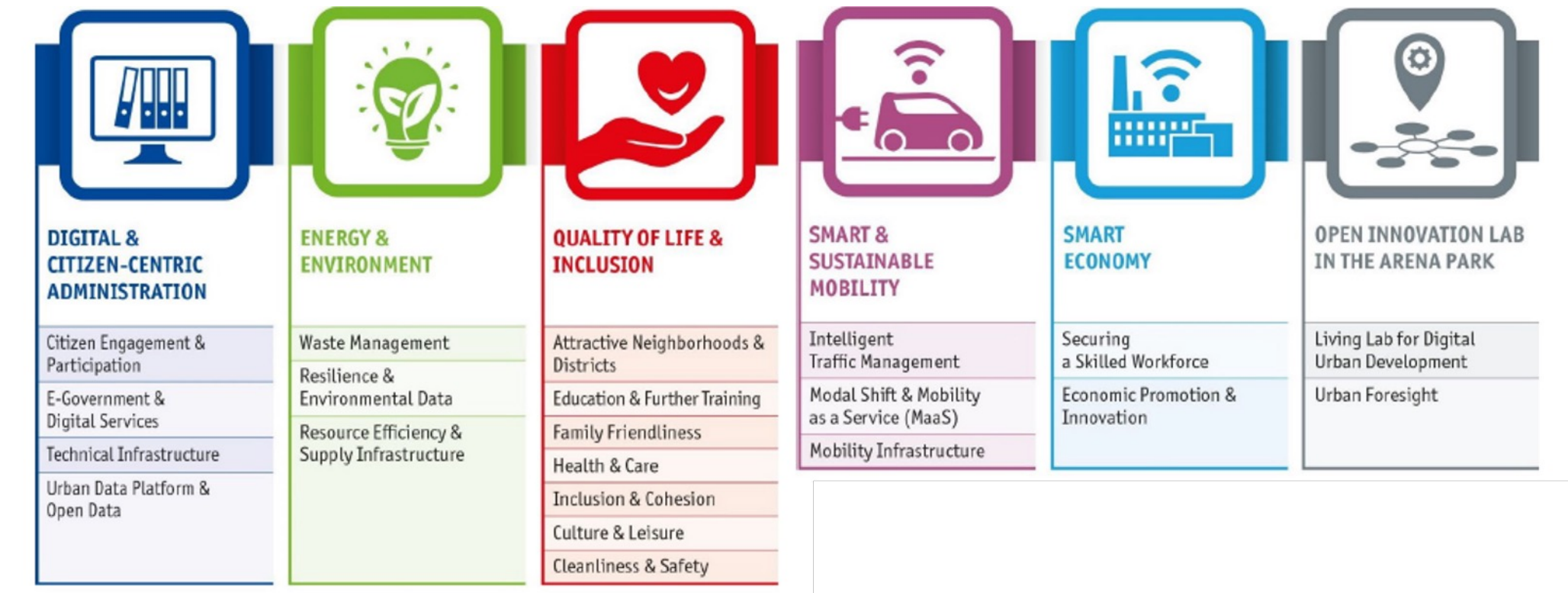


Figure 4-1: Guiding Themes and Fields of Action of the Connected City Gelsenkirchen

# ICC strategy: Vision and ambition statements 1/2

Connected Gelsenkirchen develops an **intelligent** and **sustainable city** with social and participatory urban development to improve quality of life for all inhabitants with digitization. In addition, the attractiveness as a science and business location is to be increased. We balance community, social, ecological, and economic goals to benefit the common good. In 2030, Connected Gelsenkirchen is a collectively designed and livable city for all and an innovative business location. Sustainable, resilient, with short distances is what we aim for.

## Digital & Citizen-Centric Administration

Pursuit of the digitization/ optimization of administrative services for citizens and other stakeholders

## Energy & Environment

Focus on reducing environmental pollution and actively shaping climate adaption

## Quality of Life & Inclusion

Actions that cover the essentials for a livable and prosperous city for all population groups

# ICC strategy: Vision and ambition statements 2/2

Connected Gelsenkirchen develops an **intelligent** and **sustainable city** with social and participatory urban development to improve quality of life for all inhabitants with digitization. In addition, the attractiveness as a science and business location is to be increased. We balance community, social, ecological, and economic goals to benefit the common good. In 2030, Connected Gelsenkirchen is a collectively designed and livable city for all and an innovative business location. Sustainable, resilient, with short distances is what we aim for.

## Smart & Sustainable Mobility

To reduce the environmental pollution and to increase the city's quality of life and prosperity

## Smart Economy

Aims at diversification and increase innovative capacity of the city's economy. Focus on future-oriented growth industries and securing skilled workers

## Open Innovation Lab in the Arena Park

As a lighthouse project for digital urban development. A visionary location for testing smart city solutions

# City strategy: justification

Most of the solutions are closely linked and generate positive synergies.

For example, the multi-band mesh network creates a future-proof Internet of Things network infrastructure that can be successively expanded over the area, enabling the implementation and scaling of diverse IoT-based smart city applications. The network thus forms the basis for the rollout of new applications and smart services in Gelsenkirchen.

Other projects that require a secure transmission option, such as the GEgrünt project, could benefit from this. The environmental data collected from GEgrünt for example could in turn be used for mobility planning and thus have a positive impact on the project GEbewegt. The projects are planned entirely in line with the strategy of the Connected City of Gelsenkirchen and should ideally contribute to each other and will be explained later on.

Two important thoughts that have guided us on our way:

- Good communication and cooperation between science, business, administration and citizens is essential for project success.
- Digitization projects should not be carried out just for the sake of digitization. Actual challenges and needs must first be discussed in order to subsequently develop the appropriate solution.

# City Ecosystem

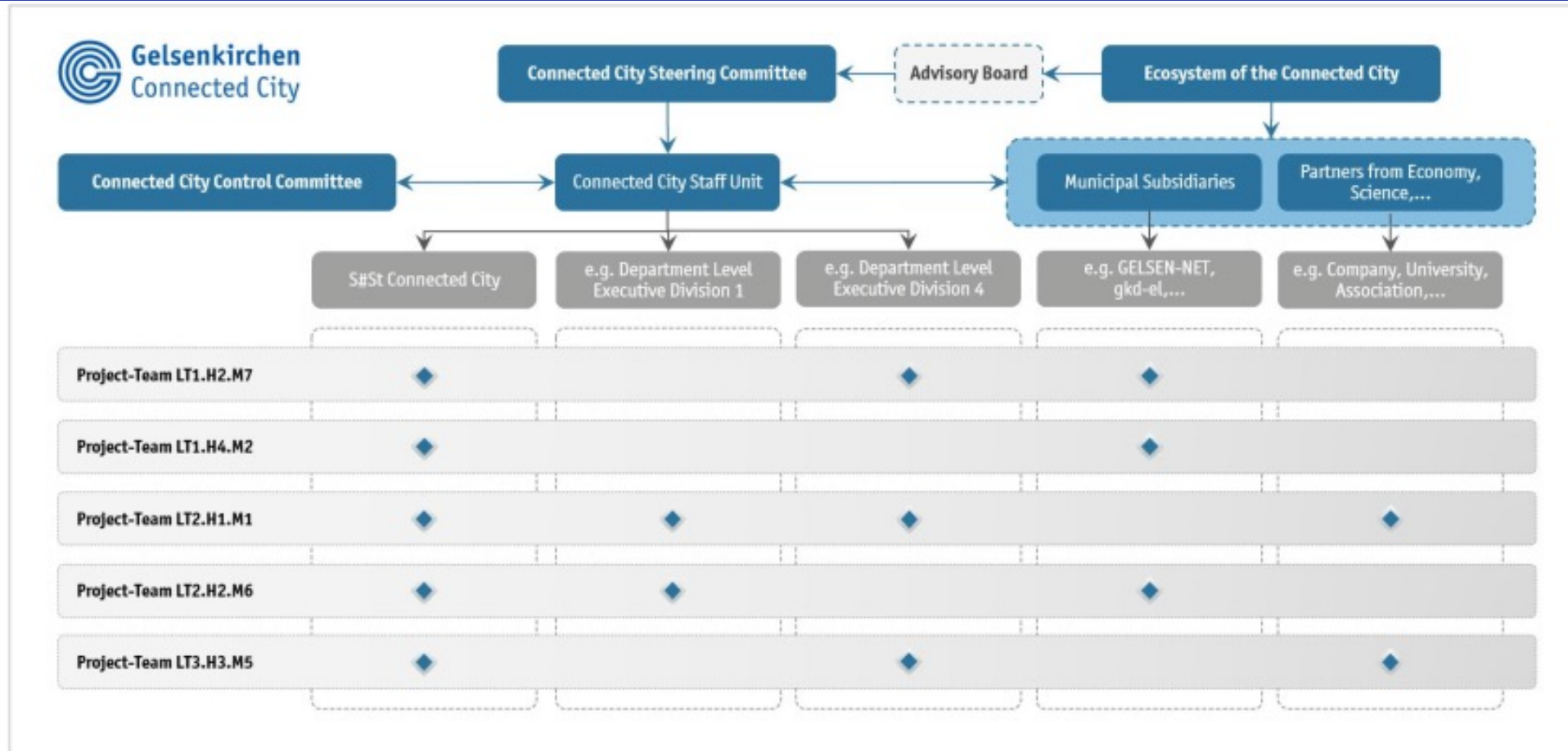


Figure 6-2: Work structures in the implementation of measures of the Connected City

Section

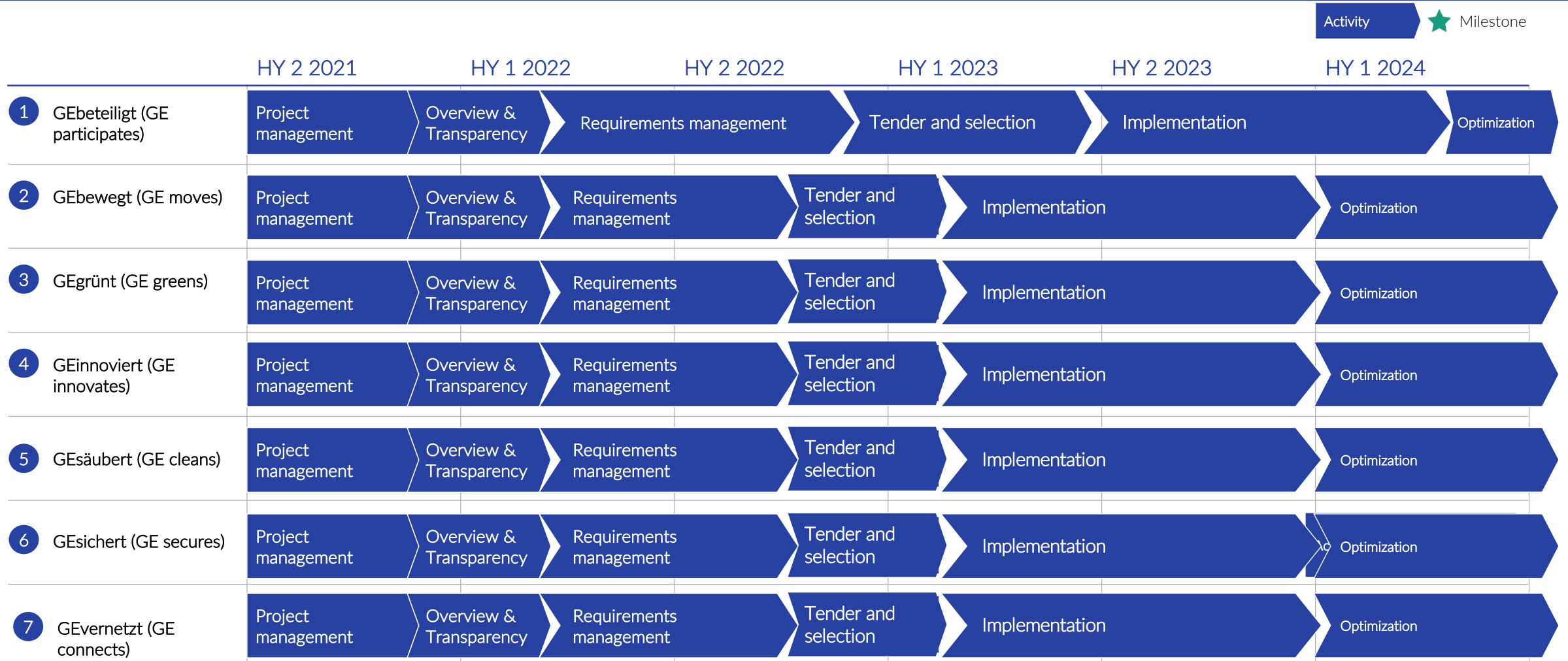
# 2

## Gelsenkirchen : Ambition and roadmap

ICC Transformation

February 2021 to May 2021

# High level implementation roadmap (“10000m plan”)














# Rationale to road map












- Because each project is in the same funding pool, identical progression occurs.
- Due to the delay in recruiting personnel, the projects could already be largely planned but not yet implemented.
- Of course, there will occur differences in the projects in some places as we go along.
- It is important that each project is assigned a project manager (Milestone will be reached by January 2023)
- Until then, consortia have been formed with various stakeholders in the city to support the projects at all hierarchical levels.



# Initiative charter Model Projects Smart City - GEbeteiligt


Strategy	Stakeholders involved	Inputs, outputs, outcomes and impacts
<p><b>Description</b></p>  <p>Establishment of a city-wide online participation platform. This should give citizens the opportunity to participate in the decision-making processes of the city at any time. The project should be open-source based and tailored to the requirements of the city.</p>	<p><b>Solution lead:</b> Staff Position Connected City</p>  <hr/> <p><b>Solution working team:</b></p> 	<p><b>Source of funding and estimated cost</b></p>  <p>270.000,00 € for material and investment costs funded by federal ministry of the interior and for home affairs (BMI)</p>
<p><b>Link to vision</b></p>  <p>It focuses on the statements "a collectively designed and livable city for all" and "a city of short distances" of the vision.</p>	<p><b>Contributors:</b> Staff Position Connected City, Department 12/1 – Communication, municipal IT service provider "gkd-el", other departments</p> 	<p><b>Solution maturity outputs</b></p>  <p>Establishment of a public participation platform</p>
<p><b>Link to ambition statement</b></p>  <p>It is anchored in the Guiding Theme "Digital &amp; Citizen-Centric Administration" and affects the Field of Action "Citizen Engagement &amp; Participation"</p>		
<p><b>Expected impact and timing</b></p>  <p>September 2022 - March 2025</p> <ul style="list-style-type: none"> <li>Promoting participation and digital sharing on various urban topics (such as urban development or tourism)</li> <li>Strengthening democracy and transparency</li> <li>Reduction of barriers that exist with analog or previous participation formats</li> <li>Increasing the quality of decision-making processes in the city</li> <li>Etc.</li> </ul>	<p><b>Risks and mitigation</b></p>  <p>Key risk is that the platform is not thought of from the user's point of view, thus does not find acceptance and is not used.</p> <p>One challenge could be to mobilize the citizenry to participate and to initiate a cultural change in the city administration and city society.</p>	<p><b>City performance outcomes and impacts</b></p>  <p>Participation, transparency, openness, co-creating, trust, Increasing the quality of decision-making processes, greater engagement from the citizens</p>


# Initiative charter MPSC - GEbewegt


Strategy	Stakeholders involved	Inputs, outputs, outcomes and impacts
<p><b>Description</b></p>  <p>This project is intended to strengthen the optimization of local transport and the strengthening of the environmental network. With the help of sensors to be installed in local transport vehicles, passenger counts and passenger information are to be collected. This information forms the basis for route planning/timing and can supplement mobility services on the first and last mile. Toward mobility as a service.</p>	<p><b>Solution lead:</b> Staff Position Connected City</p>  <hr/> <p><b>Solution working team:</b></p> 	<p><b>Source of funding and estimated cost</b></p>  <p>475.000,00 € for material and investment costs funded by federal ministry of the interior and for home affairs (BMI)</p>
<p><b>Link to vision</b></p>  <p>It focuses on the statements “a collectively designed and livable city for all”, “a city of short distances” and “a pioneer in taking advantage of the opportunities offered by digitization in Germany” of the vision.</p>	<p><b>Contributors:</b> Staff Position Connected City, Board Division 6 – “Planning, Construction, Environment and Real Estate” ,Bogestra, Vestische (perspective)</p> 	<p><b>Solution maturity outputs</b></p>  <p>The data sets collected with sensors can be blended with other municipal data, analyzed and visualized. A corresponding data infrastructure, including the necessary interfaces, is required (“urban data platform”) and is being planned.</p>
<p><b>Link to ambition statement</b></p>  <p>It is anchored in the Guiding Theme “Smart &amp; Sustainable Mobility” and affects the Field of Action “Mobility Infrastructure”</p>	<p><b>Risks and mitigation</b></p> 	<p><b>City performance outcomes and impacts</b></p>  <p>The project will enable more efficient management of mobility planning and supply, making public transport more attractive.</p>
<p><b>Expected impact and timing</b></p>  <p>2022 to 2024 More efficient control of mobility planning and the mobility offer seamless city-wide system and corresponding harmonized data basis for mobility planning</p>		


# Initiative charter MPSC - GEgrünt

## Strategy

**Description**  In this project, a sensor network is to be created that measures environmental and climate data. With the help of this data, climate adaptation measures in the context of mobility (e.g. air quality) and green spaces (maintenance/creation) will be evaluated. The data will be transmitted via narrowband or mobile network. These data will be aggregated and analyzed to derive measures. This makes targeted urban climate monitoring possible, which enables measures to be taken to improve the quality of life on site. Presentation in the form of a dashboard for citizens is also envisaged.

**Link to vision**  It focuses the statements "a sustainable and resilient city" of the vision.

**Link to ambition statement**  It is anchored in the Guiding Theme "Energy & Environment" and affects the Field of Action "Resilience and Environmental Data"

**Expected impact and timing**  September 2021 - July 2024 (construction and expansion)  
Risk mitigation for urban society, greater engagement from the citizens



## Stakeholders involved

**Solution lead:** Staff Position Connected City



**Solution working team:**





**Contributors:**  Staff Position Connected City, Department 12/1 - Communication, Department 2/2 - Citizens' Affairs, Board Division 6 - „Planning, Construction, Environment and Real Estate“, Waste Water Company „Gelsenkirchen mbH (AGG) and GELSENKANAL“ and GELSEN-NET"


**Risks and mitigation**



## Inputs, outputs, outcomes and impacts











**Source of funding and estimated cost**  630.000,00 € for material and investment costs funded by federal ministry of the interior and for home affairs (BMI)

**Solution maturity outputs**  The collected data relevant for decision-making can be used across sectors, e.g. for mobility, planning and maintenance of open/green spaces and climate adaptation.  
The integration of the data into an urban data platform is envisaged.

**City performance outcomes and impacts**  Improvement of air quality, improvement of cities resilience, risk mitigation for urban society, greater engagement from the citizens














# Initiative charter MPSC - GEinnoviert

Strategy	Stakeholders involved	Inputs, outputs, outcomes and impacts
<p><b>Description</b></p>  <p>In this project, an "Application Center of Artificial Intelligence for Municipal Solutions (KI4KL) is to be established as a lighthouse project. Based on artificial intelligence, machine learning and data analytics, municipal applications will be developed and piloted. The focus is on the transfer of innovation into application. Application-oriented research is to be conducted and put into practice.</p>	<p><b>Solution lead:</b> Staff Position Connected City</p>  <hr/> <p><b>Solution working team:</b></p> 	<p><b>Source of funding and estimated cost</b></p>  <p>5.000.000,00 € for employee, material and investment costs funded by federal ministry of the interior and for home affairs (BMI)</p>
<p><b>Link to vision</b></p>  <p>It focuses on the statements "a strong and innovative business location" and "a pioneer in taking advantage of the opportunities offered by digitization in Germany" of the vision.</p>	<p><b>Contributors:</b></p>  <p>Staff Position Connected City, Westphalian University of Applied Sciences, Gelsen-Net, All Board Divisions, further science partners, further municipalities &amp; municipal companies (perspective)</p>	<p><b>Solution maturity outputs</b></p>  <p>The project serves as a lighthouse project for the development &amp; piloting of municipal applications based on artificial intelligence, machine learning and data analytics.</p>
<p><b>Link to ambition statement</b></p>  <p>It is anchored in the Guiding Theme "OIL" and affects the Field of Action "Living Lab &amp; Urban Foresight"</p>	<p><b>Risks and mitigation</b></p>  <p>lack of offers for public procurement, Not enough expertise in this field</p>	<p><b>City performance outcomes and impacts</b></p>  <p>With this project the science and business location Gelsenkirchen is strengthened as a nationwide competence center in the field of municipal &amp; urban solutions.</p>
<p><b>Expected impact and timing</b></p>  <p>2022 to 2025 Strengthening the science and business location, Exploiting potential for the city of Gelsenkirchen</p>		

# Initiative charter MPSC - GEsäubert










Strategy	Stakeholders involved	Inputs, outputs, outcomes and impacts
<p><b>Description</b></p>  <p>The project will pilot and introduce sensor systems. These are to be installed in different types of containers and waste bins of Gelsendienste (a municipal waste disposal company). Initially, the sensors will be installed at selected locations with high waste volumes. The data collected will enable better route planning and optimization. As a result, cost savings are possible above a critical mass.</p>	<p><b>Solution lead:</b> Staff Position Connected City</p>  <hr/> <p><b>Solution working team:</b></p> 	<p><b>Source of funding and estimated cost</b></p>  <p>509.200,00 € for material and investment costs funded by federal ministry of the interior and for home affairs (BMI)</p>
<p><b>Link to vision</b></p>  <p>It focuses on the statements "a collectively designed and livable city for all" and "a sustainable and resilient city" of the vision.</p>	<p><b>Contributors:</b></p>  <p>Staff Position Connected City, Gelsendienste, Board Division 1 – "Planning, Construction, Environment and Real Estate" and Gelsen-Net</p>	<p><b>Solution maturity outputs</b></p>  <p>The project builds on a citywide network such as LoRaWAN or the city's Free WiFi. In perspective, the data can be blended with other datasets if necessary.</p>
<p><b>Link to ambition statement</b></p>  <p>It is anchored in the Guiding Theme "Energy &amp; Environment" and affects the Field of Action "Waste Management"</p>	<p><b>Risks and mitigation</b></p> 	<p><b>City performance outcomes and impacts</b></p>  <p>The project will increase public cleanliness and the sense of safety in the city area.</p>
<p><b>Expected impact and timing</b></p>  <p>2022 to 2023 more IoT applications via smart waste garbage bins Increasing public cleanliness and perceived safety in the urban area</p>		

# Initiative charter MPSC - GEsichert

Strategy	Stakeholders involved	Inputs, outputs, outcomes and impacts
<p><b>Description</b>  The collection and analysis of anonymized movement data (taking into account data protection / GDPR and German legislation) offers a variety of decision-supporting insights for Gelsenkirchen's urban development. Among other things, the data can show potentials for the attractiveness of centers and Points of Interest (PoI) in the urban area, they are relevant for mobility planning and can be helpful for public safety. In the urban area, movement data generated via sensors and networks are to be collected, processed, blended with other data and visualized. From this data lake, fields of application can be identified and taken into account in the planning process.</p>	<p><b>Solution lead:</b> Staff Position Connected City </p> <hr/> <p><b>Solution working team:</b> </p> <hr/> <p><b>Contributors:</b> Staff Position Connected City, Gelsendienste, Gelsen-Net, Board Division 1 – “Economic Development, Law and Order, Citizen Services”, “Board Division 6 - Planning, Construction, Environment and Real Estate” and Bogestra </p>	<p><b>Source of funding and estimated cost</b>  405.000,00 € for material and investment costs funded by federal ministry of the interior and for home affairs (BMI)</p> <hr/> <p><b>Solution maturity outputs</b>  The project uses various sensors and builds on the free WiFi network of the city of Gelsenkirchen. The collected data will be supplemented with additional data sets if necessary.</p> <p>This generates decision-support data and enables new "smart" citizen services.</p>
<p><b>Link to vision</b>  It focuses on the statements "a pioneer in taking advantage of the opportunities offered by digitization in Germany" of the vision.</p>		
<p><b>Link to ambition statement</b>  It is anchored in the Guiding Theme "Quality of Life &amp; Inclusion" and affects the Field of Action "Cleanliness &amp; Safety"</p>	<p><b>Risks and mitigation</b>  Potential risks include ensuring data protection and privacy, adapting existing regulations and technical systems of the city to ensure these key principles (secure anonymized data aggregation), and social acceptance for the use of movement data.</p>	<p><b>City performance outcomes and impacts</b>  The project will enable the city to optimize infrastructure management, data-driven planning processes and increased safety in the urban area.</p>
<p><b>Expected impact and timing</b>  2022 to 2023 new "smart" citizen services better control, targeted planning and adaptation of municipal infrastructure</p>		



# Initiative charter MPSC - GEvernetzt

Strategy	Stakeholders involved	Inputs, outputs, outcomes and impacts
<p><b>Description</b></p>  <p>In this project, a citywide multiband mesh network will be established. This will enable various IoT applications and provide a future-proof digital infrastructure.</p>	<p><b>Solution lead:</b> Staff Position Connected City</p>  <hr/> <p><b>Solution working team:</b></p> 	<p><b>Source of funding and estimated cost</b></p>  <p>1.742.235,00 € for material and investment costs funded by federal ministry of the interior and for home affairs (BMI)</p>
<p><b>Link to vision</b></p>  <p>It focuses on the statements "a strong and innovative business location", "a city of short distances" and "a pioneer in taking advantage of the opportunities offered by digitization in Germany" of the vision.</p>	<p><b>Contributors:</b> Staff Position Connected City, Gelsen-Net, Board Division 6 – "Planning, Construction, Environment and Real Estate"</p> 	<p><b>Solution maturity outputs</b></p>  <p>The multi-band mesh network creates a future-proof IoT network infrastructure and increases bandwidths and gigabit speeds. An implementation and scaling of diverse IoT-based smart city applications is possible in perspective.</p>
<p><b>Link to ambition statement</b></p>  <p>It is anchored in the Guiding Theme "Digital &amp; Citizen-Centric Administration" and affects the Field of Action "Technical Infrastructure"</p>	<p><b>Risks and mitigation</b></p> 	<p><b>City performance outcomes and impacts</b></p>  <p>Future-proof and expandable multi-band infrastructure, increase in bandwidths and gigabit speeds</p>
<p><b>Expected impact and timing</b></p>  <p>September 2022 - August 2024</p> <p>Implementation and scaling of various IoT-based smart city applications</p>		

# Key Performance indicators - overview

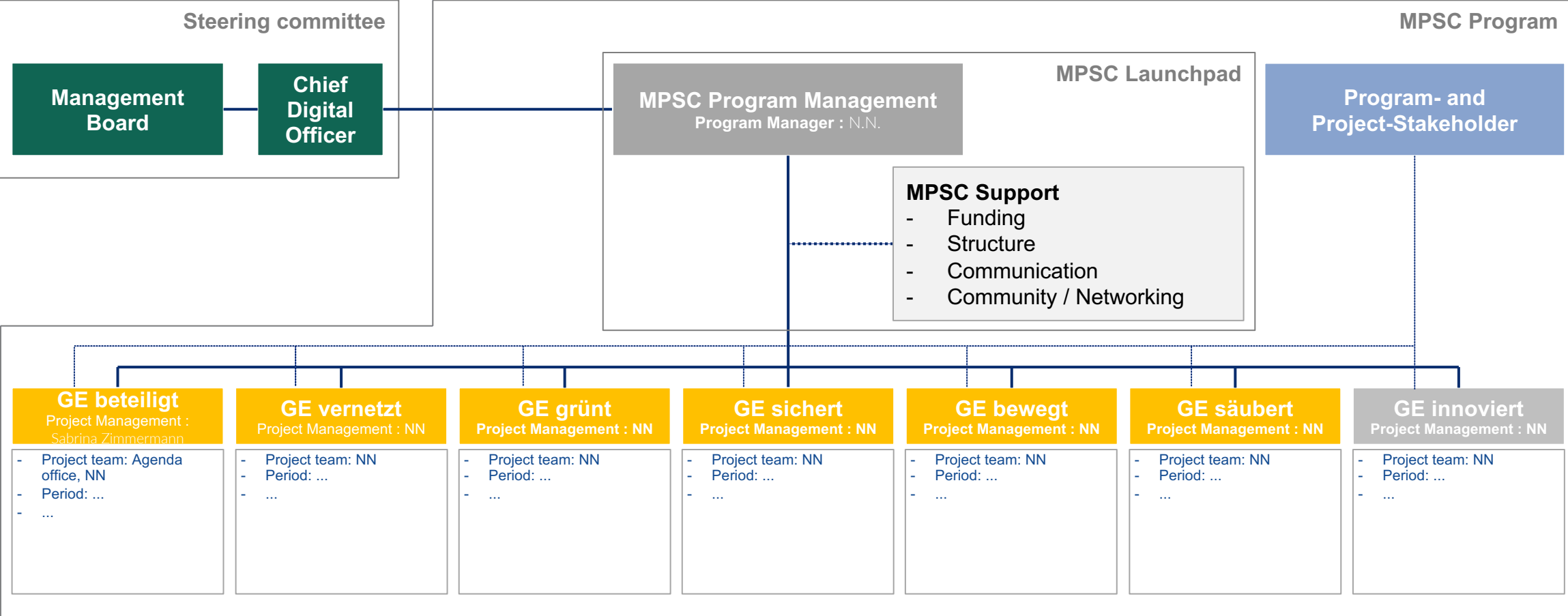
Solution	Activities – Inputs and actions	Solution Maturity - outputs	City performance – outcomes and impacts
GEbeteiligt	<ul style="list-style-type: none"> <li>Market analysis</li> <li>Internal survey on previous approaches</li> </ul>	number of survey participants, number of website views, Number of proposals submitted and implemented from the citizenry	Greater engagement and support from the citizens in local affairs, increased transparency
GEbewegt	<ul style="list-style-type: none"> <li>Testing of sensor technology</li> </ul>	Number of sensors, number of passengers	More efficient control of mobility planning and the mobility offer, more attractive public transport
GEgrünt	<ul style="list-style-type: none"> <li>Testing and installation of sensor technology</li> <li>development of various use cases</li> </ul>	Number of sensors, data collected	Decision-relevant data that can be used intersectorally, e.g., for mobility, open/green space planning & maintenance, and climate adaptation. Improvement of air quality.
GEinnoviert	<ul style="list-style-type: none"> <li>Market analysis</li> <li>public procurement</li> </ul>	Increase in efficiency in the processing of operations (time per operation), reduction Time per operation	Strengthens the research and business location as well as the transfer for other communities
GEsäubert	<ul style="list-style-type: none"> <li>Market analysis</li> <li>Testing of sensor technology</li> </ul>	Number of sensors	Reduction in emissions and increase in perceived safety and cleanliness expected after implementation.
GESichert	<ul style="list-style-type: none"> <li>Market analysis</li> <li>Testing of sensor technology</li> </ul>	Number of sensors, data collected	Optimized management of the infrastructure, data-supported planning processes, increased safety
GEvernetzt	<ul style="list-style-type: none"> <li>Planning an start of the construction of the infrastructure</li> </ul>	Number of nodes, number of IoT-applications	Future-proof and expandable multi-band infrastructure, increase in bandwidths and gigabit speeds



## Rationale to KPI approach

The KPI discussion was aligned to the KPI approach of the cities' evaluation concept described in the [smart city strategy](#).

# Governance structure for roadmap implementation



The European Commission's  
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Section

3+4

# Gelsenkirchen : Impact

ICC Transformation

February 2021 to May 2021

# Impact executive summary

All projects focused on the topics of human resources, partner acquisition and further development of the project plan. Here, the city of Gelsenkirchen benefited greatly from the ICC program and the exchange with the other participating cities.

Due to the lack of staff and the pandemic, there were some delays, which will now be made up. In the meantime, several full-time employees have been recruited, who will take over the management of one project each from January 2023 at the latest. The new staff will change the division of tasks and the individual projects can be developed more effectively.

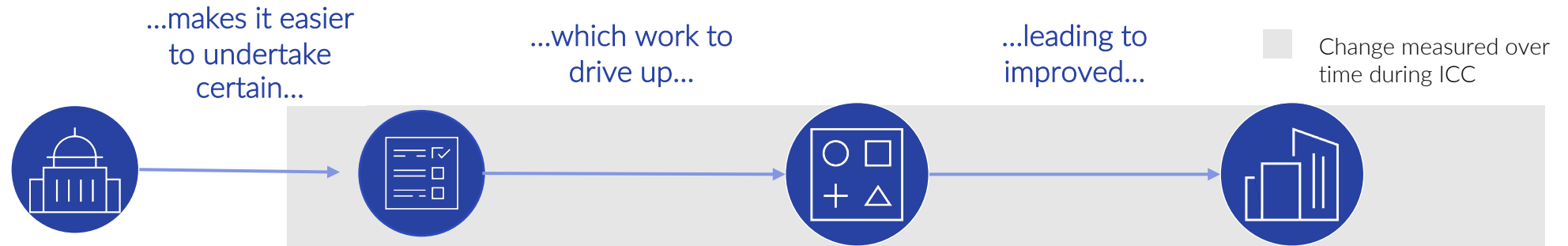
But the program management has also already been able to achieve some successes together with internal and external partners. For the GEgrünt project, for example, it was possible to test different sensor technologies in the Gelsenkirchen Open Innovation Lab, a test area that emerged from a previous funding program. Here, the project was able to benefit greatly from the previous tests and experiences. The tested sensor technology will now be gradually installed in the city area and the data will be collected and visualized in a dashboard.

The lead for the GEbeteiligt project was able to enter the project earlier and, with the help of participation activities such as surveys, gather and evaluate important information for the development of an online participation platform. Further participation activities are planned to adapt the platform to the needs of the citizens.

Apart from the delays mentioned above, all projects are running according to plan. Only in a few projects did obstacles arise that had to be overcome. The GEinnoviert project can be cited as an example here. The topic of artificial intelligence is not yet widespread in the municipal environment, which means that there is a partial lack of expertise in the field. As a result, the search for suitable partners from science and industry is currently still difficult. By issuing a new public procurement, we hope to be able to attract experts in the field and thus drive the project forward.

Over the next 3 years, the measures will be continuously developed by the German Federal Ministry of the Interior (BMI) as part of the Smart Cities Model Project funding program. In addition, the city of Gelsenkirchen is currently working on the development of an urban data platform, which is extremely important for both individual projects and the entire city and offers many opportunities in the field of smart cities. With the data platform, data from numerous projects can be blended and analyzed together to derive new measures.

# There are four types of measurable concepts that come together to drive success in the ICC



Idea	Local enablers – city characteristics	Activities – actions and inputs	Technology maturity – outputs	City performance – outcomes and impacts
Description	Each city has <b>unique strengths and weaknesses that help action happen</b> . These can be stakeholder networks, local capabilities, cultural factors or many more that drive success in ICC projects.	A city's main intervention in the ICC is to <b>take actions</b> . These can be <b>direct</b> (e.g., procuring technology), or <b>indirect</b> , (e.g., forming a working group on a topic). The right actions can lead to the right <b>inputs going in to the ICC</b> (e.g., funding, time)	<b>Cities can drive technological solutions</b> to try and improve city performance. <b>How well these solutions are currently used can be described as their 'maturity'</b> , - considering whether they are available for stakeholder use, what stakeholders think of them, and so on	Success of an intelligent city is ultimately measured by its ability to <b>address city needs</b> . These can be considered an <b>improved quality of citizen life</b> and a <b>better environment for stakeholders</b>
Example	A history of strong collaboration between city and a local university...	...allows the creation of a new e-health pilot project using social housing in the city...	...leads to the launch a new tele-health solution utilising 4G data connections...	...resulting in pre-emptive diagnosis and lower wait times at medical facilities

# Assessment of city performance - discussion

Due to delays in the project, the solutions could not yet be implemented. As a result, it is not yet possible to provide any information on the realization/achievement of the various KPIs.

# Assessment of solution maturity - discussion

Due to delays in the project, the solutions could not yet be implemented. As a result, it is not yet possible to provide any information on the realization/achievement of the various KPIs.

# Assessment of city ecosystem and activities - discussion

Due to delays in the project, the solutions could not yet be implemented. As a result, it is not yet possible to provide any information on the realization/achievement of the various KPIs.