



# 5G CITY

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## ***D6.2 Standardization and Exploitation Plan***

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## Executive Summary

The 5GCity project lives at the crossroads of a number of different domains, including IoT, smart city, 5G/RAN and virtualization, and as such (and taking also into account the high quality of its industry-led consortium) is well-poised to influence a potentially large number of communities. To achieve this, 5GCity has been developing an ambitious plan to maximize the impact of its results, not only in terms of the partners and municipalities involved in the project, but also the wider industrial and smart city communities.

In particular, 5GCity is taking a three-pronged approach. First, it will seek to influence a number of related standardization fora in a number of different domains such as 5G, IoT and smart city; a considerable number of 5GCity partners are active in such organizations.

Second, given that 90% of the 5GCity's members are industrial partners, the project's results and city pilots will provide an important means for those partners to enhance their existing product lines and potentially create new ones. Part of this document is dedicated to describing how the individual partners are planning to exploit the project's results.

Finally, an increasingly effective way of having impact and potentially influencing standards is through open source releases. Multiple 5GCity partners are active contributors to a number of open source communities and will continue to be throughout the lifetime of the project. Such partners will seek to constantly push 5GCity's results to the open source community. Along these lines, this document also presents the project's plans for open source contributions.

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# 1. Standardization Plans

The 5GCity project covers a range of different domains, including, but not limited to, edge computing, 5G, cloud/orchestration and media and broadcasting. As a result, the 5GCity partners are targeting a wide range of standardization bodies and related consortia in order to influence and disseminate the the project's results; we cover each of these in turn.

## 1.1. Edge Computing and Smart City

With respect to edge computing, the project's planning on focusing on the Open Fog Consortium (<https://www.openfogconsortium.org/>), expected to be the de-facto open source platform for any fog and edge deployment. A number of 5GCity partners are already members of this consortium, which should make it easier to disseminate project results to it. In particular, 5GCity will aim to make contributions such that the 5GCity architecture, to be finalized during the first year of the project, is considered in the definition of the OpenFog architecture.

Another relevant standardization body in the area is ETSI MEC (Mobile Edge Computing); again, multiple 5GCity partners regularly monitor this working group and will be on the look-out to provide input from the project's results. Further, we will seek to contribute with project results to the potential evolution of the ETSI MEC specification, with a focus on Mobile Edge Platform services (Geo-localization, Routing, and RNIS aspects).

Finally, in the area of smart city, 5GCity will analyse the impact of targeting other worldwide industrial forums such as the Smart City World Expo and the ITS World Congress. Further, we will investigate the integration of project results into several related standardization bodies: (i) as members in AENOR CTN 178 Committee focused on Smart Cities and City Protocol Society; (ii) as members in City Networks as EUROCITIES, Major Cities of Europe or WeGo; and (iii) as support of AENOR1 and CPS Delegations in ITU and ISO (Sustainable Communities).

## 1.2. 5G/RAN

In the 5G/RAN area, our main target will be the Small Cell Forum. While strictly speaking not an SDO, the SFC is an industry forum where different companies collaborate to leverage on standards from other SDOs (3GPP, ETSI, etc.) to produce diverse types of documents as part of the SCF Release documentation packages focused on Small Cells. 5GCity partners participate to the SCF in diverse working groups such as 5G & TECH, where virtualisation, 5G, slicing, and other technologies are discussed with a focus on Small Cells. Here 5GCity plans to use the context of SCF meetings, plenaries and summits to participate and contribute with the project's results.

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Finally, 5GCity also aims to contribute to the Open Networking Foundation (ONF) in order to standardize communication interfaces according to the 5GCity architecture definition.

### 1.3. Cloud and Orchestration

In the general area of cloud/virtualization and orchestration, the 5GCity consortium will aim to contribute to standardization bodies with the following activities:

- Contributions to virtualization-related bodies such as ETSI NFV and the IRTF's NFVRG, and in particular dissemination of the lightweight virtualization technologies being developed in the project in order to influence those group's decisions.
- Analysis of NETWORK SLICER models according to the major SDOs (ONF, NGMM, 3GPP) and how it fits into the project's neutral host scenario.
- Contribution to the evolution of Open-source platforms (OSM) with project results related to Multi-VIM topics.
- Contributions to the evolution of Open-source platforms (ODL) with project results related to the integration between ODL and ETSI MANO WIM functionalities.
- Investigation of the ETSI MEC specification and its mapping to the ETSI NFV architecture (definition of policy framework, multi-site network operator services, APIs, gap analysis, etc.).

### 1.4. Media and Broadcasting

Since several of the 5GCity partners and use cases are in the area of media and broadcasting, the project will also target standardization activities in this domain. The media and broadcasting sector has several specificities when compared to other industries and, in order to prevent vendor lock-in, standardization efforts have been created in order to provide networked media systems that preserve content identity and metadata from cameras through different types of workflows. The presence of 5GCity partners in different types of standardization bodies, especially in the Networked Media Open Specifications (NMOS, [www.nmos.tv](http://www.nmos.tv)) emergent standard created by AMWA and EBU will be significantly relevant. 5GCity's results can be used to demonstrate the viability of increasing the adoption of cloud based technologies by broadcasters and therefore provide NMOS with relevant inputs to its work. This will allow 5GCity partners to gain a competitive advantage when compared with its competitors when future standards resulting from the NMOS initiative make their way to the market. As a result, 5GCity will actively join working groups in industrial standardization bodies like the Society of Motion Pictures Engineers (SMPTE) or the EBU in order to incorporate the results of the 5GCity project into document drafts recommending extensions for standards that are currently being discussed within these forums.

Finally, 5GCity will also target dissemination of project's results into other SDOs such as DVB (Digital Video Broadcasting) and ITU (International Telecommunication Union).



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## 2. Exploitation Plans

Nearly 90% of the 5GCity consortium is made up of industrial partners. As a result, the project is well placed to apply and exploit its results. In this chapter we outline the exploitation plans of each of the individual 5GCity partners.

### 2.1. Ubiwhere

Smartlamppost is an emergent product aimed at solving smart cities' ability to grow and scale efficiently. According to a city's needs, it leverages urban furniture to elegantly provide (1) telecommunication capabilities, (2) EV-charging stations and (3) edge computing capabilities, providing a platform for innovative solutions to unfold, fostering a rich ecosystem of partnerships between different industry verticals.

Such innovative solution is powered by the research activities of 5GCity, where Ubiwhere is designing and developing a CCAM (Cooperative and Connected Automated Mobility) solution, leveraging Edge Computing, NFV (Network Functions Virtualization) and V-RAN technology. The overall goal of the project is to *"build and deploy a common, multitenant and open platform that extends the (centralized) cloud model to the extreme edge of the network, (...) to solve the main open research challenges in the 5G-based edge virtualization domain previously mentioned, including the neutral host perspective in dense deployment environments such as cities"*, closely aligned with Ubiwhere's Smartlamppost vision.

During the past Smart City Expo World Congress, in November 2017, the first prototype of Smartlamppost was unveiled, showcasing Ubiwhere's commitment to solving Telecom providers' needs to cleanly and efficiently scale, following a neutral hosting approach. The 5GCity project has been a reference to raise awareness of how such solutions are being developed as to demonstrate how the return on investment can be maximised by the whole digital market chain (i.e., municipalities, infrastructure, telecom and cloud providers). Ultimately, the outcome of such research and innovation will make its way to real-life deployments backed up by Smartlamppost's joint venture (EFACEC, Proef Group and Metalgalva).

### 2.2. Incites Consulting

INCITES Consulting SARL will take advantage of 5GCity project output to enhance its knowledge, future market reports and seminars related to 5G networks that will be deployed in future cities, with specific focus on business cases and commercial opportunities via advanced innovative use cases.

More specifically the involvement in 5GCity will give inCITES the opportunity to:

- Enhance its future market reports and seminars related to 5G networks with specific focus on new business cases and opportunities arising from the model of the Neutral Host.

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- Exploit new business models regarding 5G networking and provide a technical competitive edge in the drafting of the regulatory framework for the future digital service economy.
  - Provide consulting services to operators regarding the future deployment of 5G networks, cost charging mechanisms and sharing schemes using the neutral host model.
  - Will be able to perform techno-economic analysis for future investment plans that include various types of technologies and architectures.
  - Strengthen INCITES Consulting SARL position as the reference international center of excellence for 5G networking.

### 2.3. Virtual Open Systems

The VOSYS activity in 5GCity aims at building a vertical VIM-Hypervisor product solution which enables security and mixed criticality features in 5G networks, thus widening the possible deployments and applications of 5G networks also to city-critical environments like roads/vehicles, hospitals, industries, etc. The targets for the exploitation of such results are the city infrastructures, smart edge and Industry IoT (IIoT) markets.

### 2.4. Italtel

Italtel's history is closely connected to telecommunication innovation. Among the first companies in the world to develop VoIP (Voice over IP), today it is positioned on the most advanced communication segments. Its offer includes proprietary products, engineering and network consultancy services. In the last few years, Italtel has decided to focus strongly on new themes, widening its interests towards novel innovative topics. IoT and eHealth services, Smart cities and Industry 4.0 solutions are currently driving its R&D activities. From the technological point of view, SDN and NFV are expected to redesign the Italtel product portfolio following two important lines of development:

- Virtualisation and cloudification, providing scalability, flexibility and the other cloud principles.
- Improvement of the programmability of the network, statically and dynamically, to reach better QoS and QoE, optimise operational activities (configurations of new devices or nodes) and runtime activities (guarantee specified Service Level Agreement).

In this context, to address the huge capacity demands of new applications anywhere - seamlessly and securely, Italtel is putting a very strong attention to the 5G specifications and developments, as a perfect unifying framework for present and future applications. 5G is perceived as a possibility to improve current operation and business position in existing markets, and to create new markets in which to secure a strong leadership position.

The 5GCity project is highly valuable for Italtel for different reasons. First, leveraging the innovations carried out by the 5GCity project, Italtel will exploit it for the innovation of its product line getting high performance Edge Cloud solutions at lower costs, enabling a possible expansion from the traditional mobile market to new opportunities coming from the adaption of the "Neutral Host" model in the 5G infrastructure. Further, the Italtel commercial launch of NFV services has just begun, and though it is expected to bring benefits in the short/medium term, the implementation of some of the features advocated by 5GCity, such as full network softwarisation

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and cognitive network management realized on a highly flexible, efficient and scalable platform, are likely to take some time. In this evolution process, experience and lessons learned from 5GCity will provide valuable guidance about deployment, management and control of NFV infrastructure.

## 2.5. Wind Tre (H3G)

Wind Tre will explore the sustainability of new solutions proposed in 5GCity from a technical and an economic perspective so as to have a complete vision of all opportunities and to obtain benefits from the new approach to realize on a highly flexible, efficient and scalable platform.

Wind Tre will evaluate in the next months how to provide innovative services of greater quality and higher network speed, in line with the growing demand for connectivity and with the consumption and expectations of families and businesses

According to the exploitation strategy, Wind Tre will evaluate how to deal with the progressive outcome of the project to create novel and concrete opportunities for generating competitive advantages and to deliver a substantial improvement in innovation capacity: the first phase of this is correlated with the availability of the use case requirement description and the architectural design.

## 2.6. I2CAT

I2Cat will seek to exploit 5GCity's results in multiple different exploitation scenarios:

- **Exploitation Scenario #1: In house SDN/NFV tool enhancement:** 5GCity represents a unique opportunity for i2CAT to extend its know-how in the area of NFV/SDN and MEC technologies. i2CAT will strive to leverage outcomes from 5GCity in its capacity as software developers producing NFV functionalities, middleware and SW modules for SDN/NFV solutions. i2CAT has extensive expertise implementing and using SDN/NFV and Cloud tools such as OpenNaaS, TeNOR, CHARISMA CMO (all developed by i2CAT) or other open source platforms like OpenDayLight or OpenStack.
- **Exploitation Scenario #2: Wireless network virtualization:** I2CAT will develop new tools to virtualize the wireless networking environment in order to provide slicing capabilities to the RAN in the 5GCITY neutral host UCs. A scheduler for wireless, virtual interfaces will be developed, enabling slicing in the wireless domain. Further, i2CAT will develop a NETCONF Southbound API for the wireless SDN controller for the management and control of the wireless devices. I2CAT envisions collaborating with Accelleran to integrate small cells with the wireless SDN-based architecture. Altogether, this will allow i2CAT to gain significant knowledge in the design and implementation of SDN-based 5G Multi-RAT solutions to be used in future projects and for the transfer to potential commercial partners.
- **Exploitation Scenario #3: Leverage for future projects:** i2CAT plans to consider re-using/leverage modules developed in the 5GCity project, especially the 5GCity SDK, backend orchestrator, the wireless RAN scheduler and the SDN-based NETCONF framework, in 5G-PPP phase 3 projects.
- **Exploitation Scenario #4: Knowledge and Technology Transfer:** i2CAT's vision is to achieve Internet excellence in research and innovation activities applied to the market needs, and

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become an international strategic partner driving the deployment of the Internet across the economic, industrial and social sectors; by enhancing the competitiveness through innovation and technology transfer. i2CAT, as a research centre working in close collaboration with universities, is also continuously interested in knowledge transfer by offering scholarships to university students.

Moreover, i2CAT, as a private foundation, regularly presents the outcomes of the projects in which it is involved to its board of trustees, composed of key players in the telecom industry such as Nokia, Cisco, Interoute or Vodafone, among others.

## 2.7. NEC

NEC will seek to exploit the results of the 5GCity by incorporating the outcome of the project into a number of different product lines. In particular, these include, but are not limited to:

- *Agile Virtualization Platform (AVP)*: we will aim to enhance components of this platform by leveraging the tool for automated creation of specialized, lightweight OSEs and VMs that the project is developing. More information on AVP can be found at <http://www.nec.com/en/global/solutions/nsp/avp/index.html>.
- *NEC the WISE IoT Platform*: we will aim to enhance the platform in two ways. First, by once again using the tool for creation of minimal, specialized OSEs, which would be ideal to run on resource-constrained devices typically found in IoT environments. Second, by enhancing NEC's IoT portfolio with the implemented city use cases (in particular the illegal dump use case). More information on the platform can be found at <http://www.nec.com/en/global/solutions/iot/iotplatform/index.html>.
- *NEC Cloud Solutions Portfolio*: we will aim to use the extremely lightweight virtualization results of 5GCity to enhance NEC's cloud solutions, perhaps by offering fine-grained, just-in-time cloud-based services. More information about NEC's product line can be found at <http://www.nec.com/en/global/solutions/cloud/>.

## 2.8. Nextworks

Nextworks' first objective in 5GCITY is related to the open source MANO stack in relation to the area of monitoring and to the project topic of dual edge-core orchestration over a neutral host scenario. Nextworks' is also interested in intercepting the project's VNF catalogue, especially in relation to media handling and manipulation and foundation networking functions related to the area of monitoring, routing and security.

Nextworks' second objective is related to the Mobile Edge Computing orchestrator, which potentially represents an innovation aspect of the product, achieved by the mapping of MEC architecture to a pure NFV ETSI framework.

Nextworks is also interested in the 5GCITY SDK, aiming at intercepting a framework for the creation of NFV artefacts (more specifically VNF packages and NSd items), which can be used in an agnostic way over different MANO stack solution.

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In addition, Nextworks will aim to use the knowledge gathered in the project to provide consultancy and/or training services in the following areas:

- edge/core virtual infrastructure design
- modules for MEC/NFV orchestration (3rd party development)

Finally the overall experience gathered within the project related to a multi-domain (core/edge) service orchestration oriented to media application can be capitalized by Nextworks to enhance its media product family (aka Symphony) by deploying the results in a distributed and virtualized environment and by empowering it with new functionalities related to orchestration and control.

## 2.9. RTV Cellnex

From the project deployment and implementation Cellnex is aiming to be able to build a 5G network within the city joining the different actors and resources. As a Neutral Host, Cellnex's exploitation plans would focus on assuming the role of a single point of contact with operators and owners by providing advanced connectivity, turnkey solutions, flexible business models and acting as a real independent entity.

Cellnex will ease an operators' difficulty in deploying their base stations and will guarantee the service with high quality standards. On the other hand, owners will be able to rely on a single point of contact which takes care of the technical solution and is permanently in touch with the operators. The system deployed by Cellnex as the Neutral Host is multi-operator, which means that a single infrastructure is used by all the operators, thus minimizing investment and esthetical impact. Both operators and owners will reduce their operational burden and will be benefit from an accelerated deployment.

From the project outcomes Cellnex would like to focus in learning and acquiring knowledge (by making tests and field trials) about how to better collaborate in deploying the city infrastructure and which services can arise from the implemented systems and deployed technologies and resources.

In the end, we see that in coming years a lot of infrastructure will be deployed in cities and we would like to find new services and business coming from these implementations. Trials and tests with operators and owners will be crucial to defining these new services and developing new business models.

## 2.10. University of Bristol / Bristol is Open

UNIVBRIS (HPN), with its experience in research and development, will promote the collaboration between partners for scientific dissemination of relevant technologies resulting from the project. Some research areas to be exploited from the 5GCity project include:

- Access and mobile network virtualisation approaches for "Neutral Host" including wireless virtualisation and edge computing slicing.

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- Resilience service placement and lifecycle management in 5G-edge to ensure fault tolerance and to increase Quality of Service for multi-tenant smart city environments (i.e., Resilient Neutral Host planning and deployment).
  - Improve and further develop the media vertical use cases in collaboration with local partners (media studios, TV stations and communities) to enable novel ideas using the advancements in 5G.
  - Openflow protocol extensions to enhance end-to-end network convergence and multi-domain control and slicing.

## 2.11. Municipality of Lucca

Beyond support for deployment of the neutral host platform, the city of Lucca is mainly interested in implementing the illegal dump use case. This is of particular relevance to the city since it hosts multiple major international events that attracts very large crowds. There is currently no automated system for illegal dump detection: Lucca will seek to use the project's results, and in particular the application of deep neural networks, to implement and deploy an edge-based automated detection solution that could potentially alert the relevant authorities in real time. Finally, the city of Lucca will also work together with CODI with the aim of implementing the UHD video distribution use case, technology that would later be useful for the large yearly events previously mentioned.

## 2.12. IMI

IMI aims to craft city infrastructure with the capability to support multi-protocol gateways for IoT/M2M2/Wireless Urban Lab projects, including the capability to act as a neutral host (i.e. city as operator). In particular, IMI will exploit results in the following areas:

- Management and orchestrator component for edge-based infrastructure.
- Exploitation of the different pilots in the city of Barcelona to attract future city services.

## 2.13. RAI

RAI will exploit project results in two different areas: (i) the final user area to enrich the television experience and (ii) in the television production area to use the new network to facilitate the covering of events, exploiting 5G features by providing new services: from audio/video UHD video distribution and 360° video experience up to the virtual/augmented/mixed reality for immersive services. In particular, RAI plans to exploit:

- Knowledge in IP-end-to-end highly distributed broadcast production workflow, cloud/edge-based video and audio encoding, mixed reality for improved TV entertainment.
- New TV formats enabled by new features offered by the 5GCity technologies.

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- Integration of the media company production workflow with new distributed edge network and computing technologies.

## 2.14. BTV

BTV aims to exploit 5GCity results in order to improve the live broadcast system with the aim to disseminate the content more effectively (making HD signal transmission at different rates). It will leverage 5GCity to carry out analysis of real-time media transmission in city pilots.

## 2.15. Accelleran

One of the main goals of Accelleran is the delivery of Carrier and Mission-Critical grade Small Cells to our customers, MNOs and CSPs, with the lowest Total Cost of Ownership, yet the greatest flexibility to provide different services, possible. Developing neutral host solutions with network sharing, network slicing and other enabling capabilities within a virtualised Small Cell, we as a company, can foster new compelling business models in the use of small cells as a service and the integration of new verticals in the smart cities.

## 2.16. Comunicare Digitale (CODI)

As an independent digital platform with a well-known digital network in Europe (*and Latin America, Russia and USA*) CODI is able to aggregate digital media, players and drivers to test the first UHD/4K contents trial with 5G. With a great 4K/UHD library and a real primacy on the new digital frontier, it will be interesting to test the first premium proposal and check the use in the 5GCity cities. Throughout workshops and events organized in Italy and Europe (*Seville, Bruxelles, Moscow, Munich*) we have the opportunity to show results and items regarding the trials, in cooperation with the Ultra HD Forum, Fame, Cic Media and Smpte (*Usa*), Cstb Mid Expo (*Russia*) in an important technical comparison with Ebu and Dvb. In particular, CODI will exploit 5GCity in the following ways:

- UHD Content distribution through the Lucca infrastructure.
- Creation of new 4K/UHD content based on users' experience.

## 2.17. ADLINK

*ADLINK develops and commercializes the Vortex Intelligent Data Sharing Platform for Business Critical Internet of Things (IoT) applications. Through its participation in the 5GCity project, ADLINK aims at enhancing the products Vortex Cloud and Vortex Fog.*

- *Virtualization of data at rest and in movement providing uniform access of data regardless of its location in the edge infrastructure through OpenDDS.*
- *Virtualized data abstraction for analytics allowing computation to be expressed uniformly.*

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## 2.18. MOG

MOG Technologies is a technology provider, developing solutions (hardware and software) to enable different types of media workflows. Despite its strong presence in the broadcasting area (SONY, ADOBE, AVID, Al-Jazeera, Disney, HBO, Apple, BBC, RTVE and FOX are among its clients), in more than 40 countries, using cloud computing and state of the art telecommunications technologies like 5G for the professional media sector is relatively new for MOG. In the broadcasting sector, MOG will use the developments from 5GCITY to target broadcasters and media production companies (e.g., newspapers) and similar organizations. Event organizers, like municipalities or cultural/sports associations are also another important target marketing group for the company as they can use the application to cover events lease the equipment (cameras, cables, etc.) from MOG, and use the virtual newsroom application to deliver a high quality personalized edited video to a large number of users. It's important to note that MOG's strategic alliance with Level 3 Communications, a major global cloud provider, will facilitate MOG's market penetration, in this specific segment, and the creation of new business opportunities.

Therefore, the company intends to develop a novel marketing strategy for this new area, which includes participation as an exhibitor in the most relevant trade fairs like IBC, NAB and WEB Summit and a strong web presence. Main competitors in the broadcasting industry are AVID, which has a strong presence in professional editing, or Anvato that has a technology capable of live streaming events and cloud production. However, the market still does not offer a solution capable off seamless editing on the fly through a multiplayer interface several broadcast high quality feeds; and, this solution coming out of 5GCITY could be further combined with those of AVID or ANVATO, having a multiplier effect.

MOG is mainly a product-oriented company, thus the developments of 5GCITY will be incorporated in existing products (ingest line) as innovative new features or be used to increase the company portfolio and then sold/licensed. MOG will also be able to provide and sell training and consultancy services to the set of clients described above that need to increase the visibility of a brand or increase their actual sources of revenues.



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## 3. Open Source Contributions

While strictly speaking this is clearly not a standardization activity, nowadays open source contributions are increasingly seen as a pragmatic and effective means to influence standardization: one can be much more influential towards a standardization group regarding a particular architecture or feature if he or she already has a working, detailed implementation to show.

As a result, and given that multiple 5GCity partners are active members of a number of open source communities, we thought it worthwhile to mention a number of open source activities related to 5GCity results that will not only help disseminate the project's outcomes and increase its impact, but also potentially influence the standardization fora previously mentioned in this document. In particular, 5GCity plans on targeting the following contributions:

- Xen project and Linux Foundation: the automated tool for creation of lightweight VMs and specialized OSes, codenamed "Unikraft", will constitute one of the major open source contributions of the 5GCity project. In fact, the basics of Unikraft have already been released as open source as a Xen incubation sub-project under the auspices of the Linux Foundation (<https://www.xenproject.org/developers/teams/unikraft.html>). The hope is that eventually this tool can become an important player for deployments on resource-constrained devices in the IoT/Smart City domains.
- The orchestrator-integrated SDK will be released under open-source licenses, coupled with the virtualization platform, and will simultaneously support a variety of services, embraced by the same network / city infrastructure. Related to this are planned open source contributions to Opendaylight, and ETSI open-source MANO, the Open Data Plane (ODP), OPNFV, and ETSI OSM projects.
- Contributions to standard OSes (Linux) and IoT-related open source communities (e.g., the OpenIoT community which aims to develop a standard solution for Linux-based IoT solutions). Such dissemination will be done both under the form of patches (sharing code to add new functionalities, or to improve the quality of the software) and with community discussions/presentations that aim at disseminating the architecture and the concepts developed in 5GCity. At the time of this writing, the project has already submitted a patch to the Linux kernel (now merged), proposed a mixed-critical IoT speech at the Linux Foundation OpenIoT Summit (accepted to be presented on March 14th 2018) and is now planning participation to participate with a live demo at INTEROP Japan 2018 (June 13-15 2018).
- Other related contributions to open source projects in the virtualization domain such as KVM and QEMU as well as potential improvements to network stacks (e.g., lightweight IP).

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## 4. Conclusions

In this deliverable we presented 5GCity's plans to maximize its impact by targeting standardization bodies, by describing the exploitation plans of each of the individual project partners, and by mentioning a number of important open source contributions tied to the project, since nowadays this is an extremely important way to create impact and even influence standardization bodies.

Clearly this document only outlines a plan. Future deliverables (D6.3, D6.4 and D6.5) will report back on the actual achievements in terms of dissemination, exploitation and standardization. While its early days, 5GCity has already produced tangible outputs and we are confident that these further deliverables will be able to report positively on the impact that the project will have not only towards its partners but also the wider community.

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# Abbreviations and Definitions

## 4.1. Abbreviations

DMP	Data Management Plan
DoA	Description of Action
EC	European Commission
GA	General Assembly
IPR	Intellectual Property Rights
MST	Management Team
PC	Project Coordinator
PMO	Project Management Office
PO	Project Officer
TB	Technical Board
TC	Technical Coordinator
IM	Innovation Manager
TL	Task Leader
WP	Work Package
WPL	Work Package Leader

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