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Smart city

5G networks, data and public services: how to design projects that work and comply

Summary

- Cities use 5G, sensors and data platforms for mobility, safety, lighting, environment and energy. The value is in the services, but everything depends on network, data and security designed properly from the start.
- In Italy the DAS 5G call funds networks in areas of public interest, and since 29 April 2024 the electromagnetic field limit is 15 V/m, which makes small cells easier to design.
- Video surveillance and AI have precise limits under the GDPR and the AI Act. Since 2 February 2025 real-time remote biometric identification in public spaces for law enforcement is prohibited, with exceptions.
- Starting from one measurable use case, with requirements and KPIs written before the tender, reduces risk, cost and disputes.

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Context

Many smart city projects stop at the pilot. Three causes recur: networks designed without acceptance measurements, data locked inside separate systems, and privacy and security requirements dealt with after purchase.

EU rules adopted in the last two years change how cities buy: the Data Act gives access rights to data from connected products, NIS2 brings security obligations to many public bodies, and the AI Act limits video analytics. These constraints belong in the tender documents, not in the operating phase.

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Regulatory framework

Regulation or standard	What it requires	Dates
AI Act – Regulation (EU) 2024/1689	Prohibitions, including real-time remote biometric identification in public spaces for law enforcement (with exceptions); transparency obligations	Prohibitions from 2/2/2025; transparency (Art. 50) from 2/8/2026
GDPR and EDPB Guidelines 3/2019	Legal basis, data minimisation, impact assessment for large-scale video surveillance	In force
NIS2 – Italian Legislative Decree 138/2024	Security measures, supplier management and incident reporting for in-scope entities, including public bodies	Baseline measures by October 2026 for entities notified in 2025
Data Act – Regulation (EU) 2023/2854	Access to data from connected products; access by design for new products	From 12/9/2026 for new products
EMF limits – Italian Law 214/2023, CEI 211-10	15 V/m limit; environmental agency (ARPA) opinion on sites	From 29/4/2024
Italian Public Contracts Code – D.Lgs. 36/2023	Direct award of services below €140,000	In force

This document is for information only and is not legal advice. Regulatory dates and obligations must be checked against official texts at the time of application.

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Reference architecture

Citizen services mobility · safety · lighting · waste · environment	L5
Data and AI platform digital twin · dashboards · open APIs · anonymous analytics	L4
Cloud and edge processing close to sensors · on-premise data	L3
Networks 5G small cells and DAS · fibre · NB-IoT and LoRaWAN	L2
Field cameras · environmental sensors · traffic lights · smart poles	L1

Each layer has its own performance, security and management requirements: acceptance testing is done layer by layer and end to end.

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Use cases

Use case	Technology	KPIs to measure
Adaptive traffic lights and mobility	5G + edge	Latency, availability
Video surveillance with anonymous analytics	5G uplink, AI at the edge	Bandwidth per camera, privacy by design
Lighting and smart poles	Fibre, 5G small cells	Energy savings, coverage
Air quality and noise	NB-IoT, LoRaWAN	Sensor coverage, data quality
Coverage in stations and tunnels	Multi-operator DAS	RSRP, service continuity

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Getting started in 90 days

- 1 Choose one use case and one measurable success indicator.
- 2 Map network, data and privacy constraints: impact assessment and NIS2 scope.
- 3 Write measurable requirements, acceptance KPIs and data-access clauses into the specification.
- 4 Run a pilot in one area, with acceptance based on field measurements.
- 5 Decide on scale-up using the pilot data, not supplier promises.

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How Conection works

Conexion supports public bodies and companies as independent engineers: we write measurable requirements and specifications, check suppliers' designs, run field acceptance tests and train staff. We do not sell equipment, so we can stay on the side of the people who use the network.

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Sources

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