Smart City 2026 Starter Guide
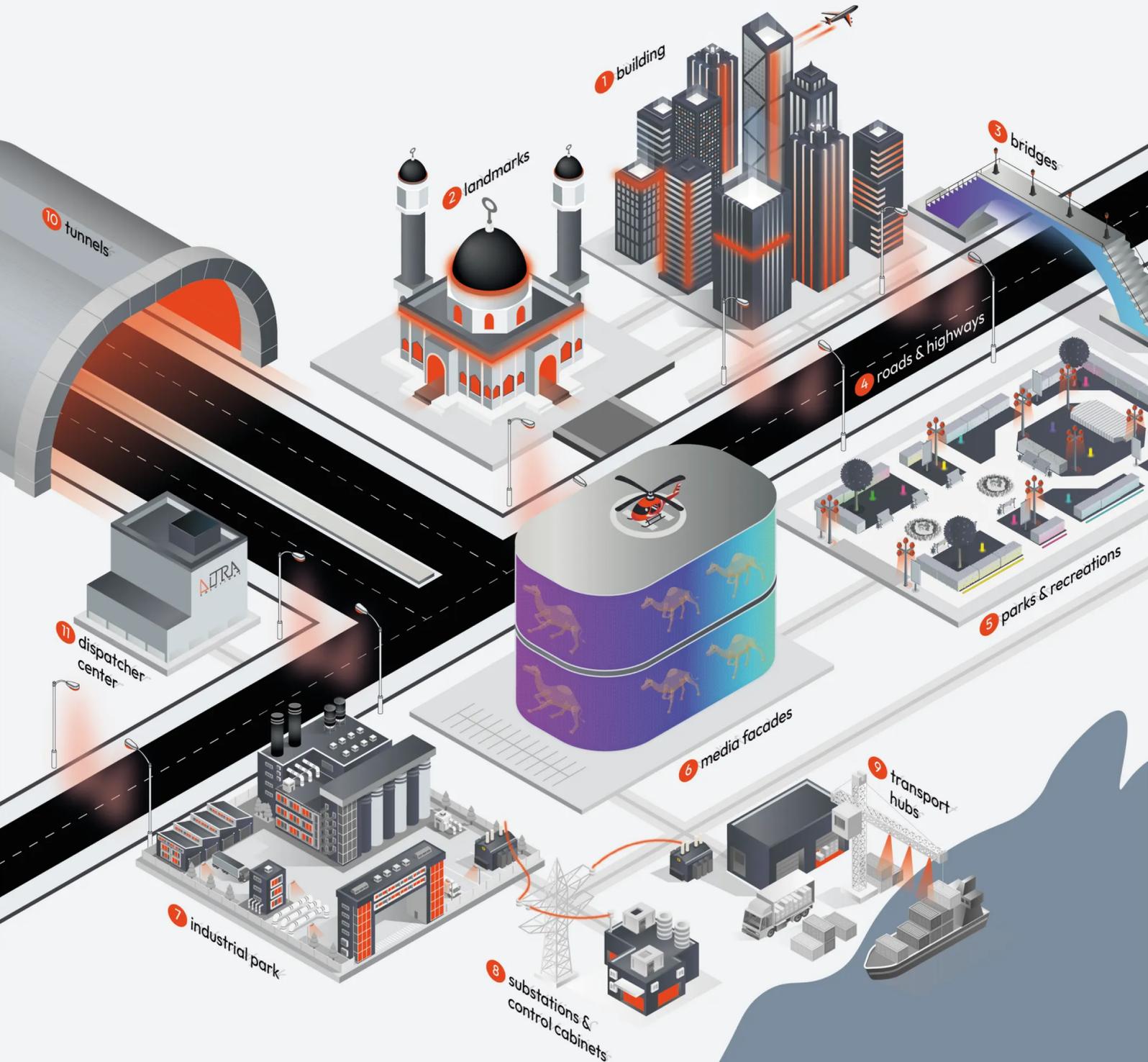
How to implement smart city projects step by step using your existing lighting infrastructure

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Intelligent lighting and smart city control systems
Prepared by DITRA Solutions

Street Lighting as a Ready-Made Network

How to implement smart city projects step by step using your existing lighting infrastructure

> **Your street lighting network is already a distributed infrastructure that can host smart services — without heavy civil works or full reconstruction.**

Modern cities are gradually moving from isolated utility systems toward a Smart City model, where energy, transport, communications, and lighting work as one interconnected ecosystem. According to the Smart Lighting Factsheet by the European Commission (2021), street lighting has one of the highest potentials to become a true "connectivity platform" for urban services. This is already a distributed network: poles are installed across the entire city, each with power supply and standardized mounting and connection points.

Because this infrastructure is already in place, there is no need to build a new network from scratch. Existing poles can host motion, daylight, and meteo sensors, communication modules, and controllers, allowing cities to scale digital services quickly, using the lighting grid as a backbone rather than launching a separate civil-works project.

Why this matters financially

- Cities often spend 20%+ of their energy budget on lighting.
- Around 75% of luminaires in use are over 25 years old and based on outdated technologies.
- Upgrading to LED luminaires plus intelligent control can reduce energy consumption by 50–70% and, at the same time, prepare the lighting network to act as the foundation for broader smart city services.
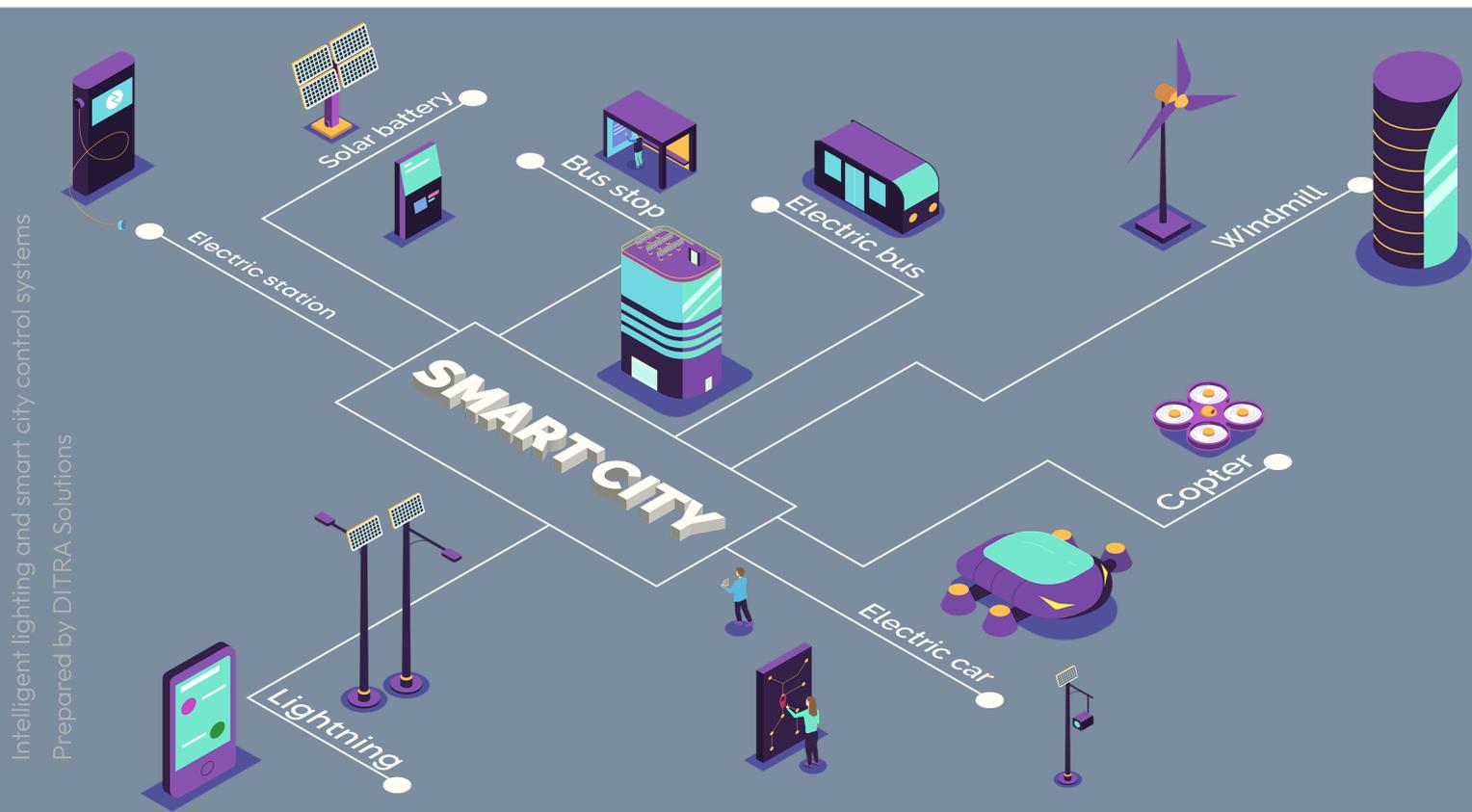
Myths:

Myth 1.

"We have to replace all the infrastructure."

Reality:

Most projects start with 5–10% of the lighting network — a few key streets, a district, or a waterfront area. If the architecture is open and scalable, this pilot can later grow to the whole city.

Myth 2.

"Smart city projects are only for very large capitals."

Reality:

Medium and even small cities can benefit from connected lighting and sensors: safer crossings, better energy control, fewer emergency call-outs. The overall budget can remain modest, while the impact for residents is clearly visible.

Myth 3.

"It's too complex and expensive."

Reality:

When implemented step by step, these projects often pay for themselves through:

- reduced energy consumption thanks to dimming and precise scheduling;
- fewer emergency call-outs and on-site interventions;
- better reporting on sustainability goals (ESG, CO_2, and overall environmental quality).

With the right architecture, you can capture these "quick wins" first and then gradually add new services without having to redo what has already been built.

Step 1.
Choose Your Lighting Control Architecture

Before adding sensors or software, the lighting network has to become something you can reliably control. The first practical decision is simple but crucial: **what control architecture will you use, and where will you start?** This step defines how easily the project can grow from a pilot to a full smart city system.

On the next page, a mini diagram "How to choose your control architecture" will help you quickly identify your current situation and the most realistic starting point for your first pilot area.

Quick-Start Scenarios

- **Pilot on 1–2 streets**
  Pick a visible area (main street, square, waterfront), add cabinet/segment controllers, and apply a few dimming profiles to show immediate savings and better comfort.

- **LED program with built-in control**
  Each time you replace a luminaire with LED, add a control node (NEMA, Zhaga, wired or integrated). This way, your existing LED upgrade program automatically builds a connected network.

- **Mixed fleet, mixed control**
  Use individual control where you already have LED or plan to change luminaires soon; keep legacy areas under cabinet or segment control until they are upgraded.

A Common Mistake Cities Make

Choosing a fully closed system that only works with one vendor and cannot accept third-party sensors, nodes, or platforms. An open, interoperable architecture keeps your options open and lets you add new services later without redoing the first project.
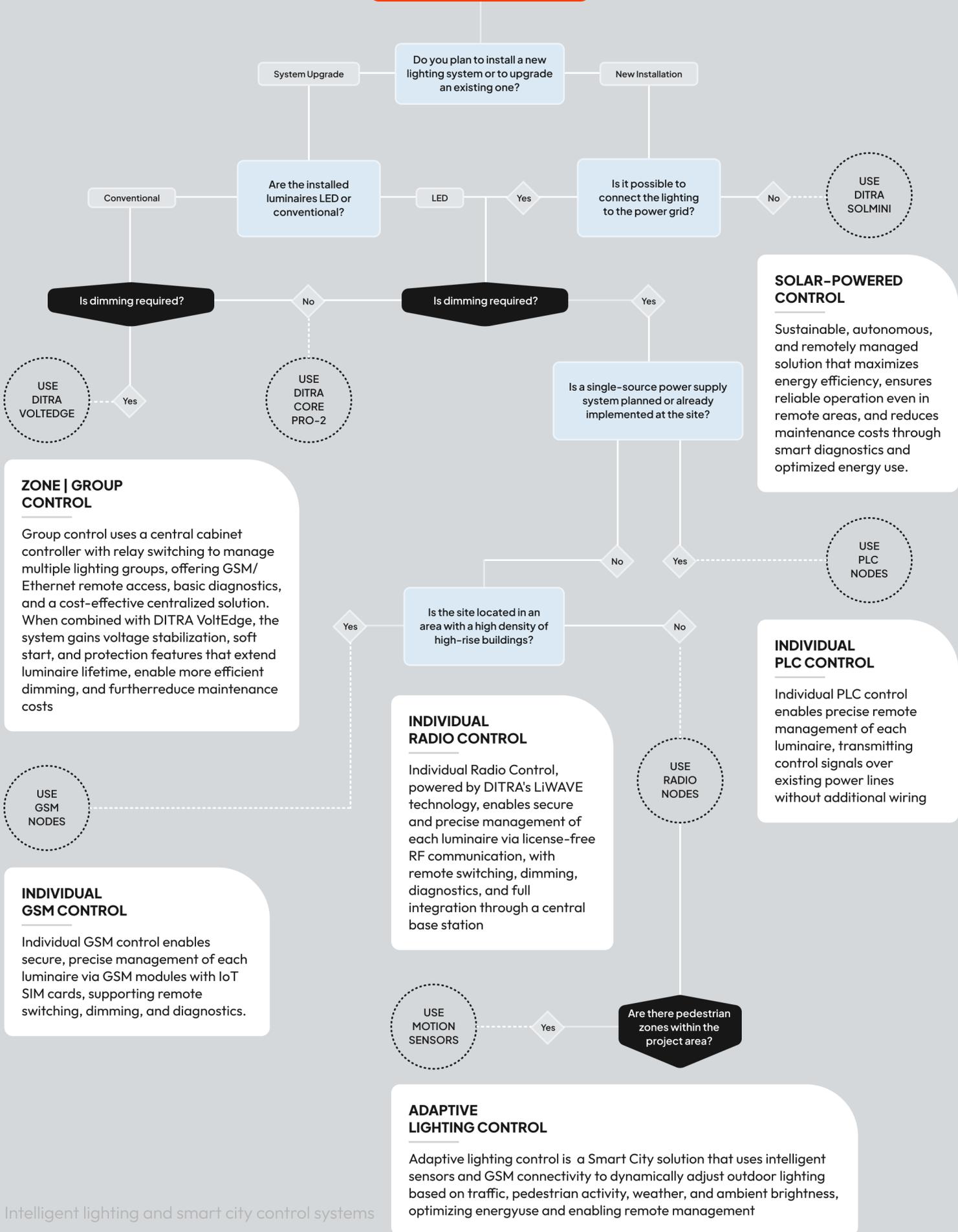
How DITRA can support Step 1

With its portfolio of cabinet and segment controllers, pole-mounted nodes (NEMA / Zhaga), and PLC/RF/GSM communication options, DITRA Solutions helps cities:

- reuse existing cabinets and feeders instead of rebuilding the network;
- combine cabinet-level and individual luminaire control within one system;
- keep the architecture open, so third-party sensors and future devices can be added later.

All controllers are designed to integrate into a central management system, so the first pilot area can later grow into a full-city deployment.

CHOOSE
OUTDOOR LIGHTING CONTROL SOLUTION
by DITRA Solutions

Do you plan to install a new lighting system or to upgrade an existing one?

- System Upgrade
- New Installation

Are the installed luminaires LED or conventional?
- Conventional
- LED

Is it possible to connect the lighting to the power grid?
- Yes
- No → USE DITRA SOLMINI

Is dimming required? (Conventional)
- Yes → USE DITRA VOLTEDGE

Is dimming required? (LED)
- No → USE DITRA CORE PRO-2
- Yes → **Is a single-source power supply system planned or already implemented at the site?**
  - No
  - Yes → USE PLC NODES

Is the site located in an area with a high density of high-rise buildings?
- Yes → USE GSM NODES
- No → USE RADIO NODES

Are there pedestrian zones within the project area?
- Yes → USE MOTION SENSORS

SOLAR–POWERED CONTROL

Sustainable, autonomous, and remotely managed solution that maximizes energy efficiency, ensures reliable operation even in remote areas, and reduces maintenance costs through smart diagnostics and optimized energy use.

ZONE | GROUP CONTROL

Group control uses a central cabinet controller with relay switching to manage multiple lighting groups, offering GSM/Ethernet remote access, basic diagnostics, and a cost-effective centralized solution. When combined with DITRA VoltEdge, the system gains voltage stabilization, soft start, and protection features that extend luminaire lifetime, enable more efficient dimming, and furtherreduce maintenance costs

INDIVIDUAL GSM CONTROL

Individual GSM control enables secure, precise management of each luminaire via GSM modules with IoT SIM cards, supporting remote switching, dimming, and diagnostics.

INDIVIDUAL RADIO CONTROL

Individual Radio Control, powered by DITRA's LiWAVE technology, enables secure and precise management of each luminaire via license-free RF communication, with remote switching, dimming, diagnostics, and full integration through a central base station

INDIVIDUAL PLC CONTROL

Individual PLC control enables precise remote management of each luminaire, transmitting control signals over existing power lines without additional wiring

ADAPTIVE LIGHTING CONTROL

Adaptive lighting control is a Smart City solution that uses intelligent sensors and GSM connectivity to dynamically adjust outdoor lighting based on traffic, pedestrian activity, weather, and ambient brightness, optimizing energyuse and enabling remote management

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Step 2.
Choose IoT devices for Real Tasks, Not the Other Way Around

Once your lighting network is under control, you don't need all sensor types at once. There are dozens of options on the market, but these three categories most directly improve residents' comfort and safety — a truly human-centric starting point.

Safety & Comfort

Use sensors to make streets feel safer and more comfortable for people, not just for the energy report. Start with a few critical crossings, routes with safety complaints, and quiet areas that feel empty or isolated after dark.

Sensors: Motion, daylight, noise, basic meteo

Emergency situations

Here the focus is on early detection of dangerous events and timely response before people or infrastructure are seriously affected. Sensors can pick up smoke and fire, rising water levels, or unusual ground motion around critical assets.

Sensors: Smoke and fire detectors, flood and water-level sensors, seismic and vibration sensors

Environment & Quality of Life

Smart city projects are increasingly evaluated through sustainability and liveability indicators. By measuring air quality, noise, heat and microclimate, cities can improve everyday comfort, boost their reputation as attractive places to live, and support investment decisions with objective data.

Sensors: Air quality, temperature & humidity, noise, basic environmental probes

How DITRA can support Step 2

There are many types of sensors on the market, and they can be connected to DITRA controllers thanks to support for standard industrial protocols such as Modbus and CAN. This low-level communication between sensors and luminaire controllers allows cities to use both DITRA's own sensor range and third-party devices within the same infrastructure.

Step 3.
Turn Your System into a City Operating Platform

Once lighting, controllers, and sensors are in place, the next step is to bring everything together in one platform — your practical "operating system" for the city.

What the Platform Gives You

A smart city platform connects all control nodes and sensors into a single view:

- Telemetry from all devices – status of controllers, nodes, and sensors in real time.
- Advanced reporting – energy use, alarms, SLAs, maintenance KPIs.
- City map in one window – cabinets, poles, segments, and events shown directly on the map.

Instead of multiple disconnected tools, the team works with one environment for operations, analytics, and planning.

Open APIs and Modular Integration

A future-proof platform is not a closed box – it must connect to the rest of the city:

- Connect external systems as modules – CCTV, SCADA, traffic systems, city portals.
- Or share your data outward – via open APIs to other city platforms, digital twins, or reporting tools.

This modular approach lets you add new services over time without redesigning the core system every time a new idea appears.

How DITRA can support Step 3

Modern smart cities already have many separate systems, so connecting only sensors is rarely enough. DITRA Synergy works as an integration layer: it collects data from field IoT devices and DITRA controllers at the low level, and connects external systems at the top level via open APIs (for example, surveillance cameras or existing smart-city platforms). Depending on the project, it can act either as the main central platform or simply feed all required data into another city-wide system.

A Smart City Roadmap for the Next 12 Months

You don't have to do everything at once. Even if you are starting from a purely conventional lighting network, a realistic one-year path might look like this:

Audit & design the upgrade.

Map your existing street lighting network, define where to start (district, corridor, or waterfront), and choose the LED and control architecture you will use.

Q1 – 2026

Install controllers and connect the first area.

Roll out LED luminaires and luminaire / cabinet controllers in the pilot area and connect them to the central software with basic dashboards and alarms.

Q2 – 2026

Add first sensors and simple integrations.

Deploy a small set of sensors (safety, mobility, or environment) on the same poles and bring their data into the platform. Connect at least one external system, such as a reporting tool or city portal.

Q3 – 2026

Scale & review.

Extend control and sensors to new areas, compare energy and maintenance costs before and after, and plan the next phase of your smart city roadmap.

Q4 – 2026

Future…

Looking Ahead
to 2026

Let the coming year be a year of new projects, bold ideas, and real implementations. Smart city is no longer a distant vision — it is a practical path toward safer, more efficient, and more sustainable cities built on the infrastructure you already have.

Don't be afraid to move toward this future step by step. You don't need to change everything at once: even a single controlled district, a handful of sensors, and one shared platform are already real progress.

May 2026 bring you the confidence to start, the partners to support you, and the results that residents can feel in their daily lives. Let this guide stay with you as a small cheat sheet for the year — a reminder that every smart city journey starts with a few concrete, manageable steps.

Wishing you a bright, smart, and sustainable New Year — with streets that are safer, cities that are smarter, and projects that you'll be proud to look back on next December.Happy New Year 2026!

DITRA Solutions Team

Merry
Christmas