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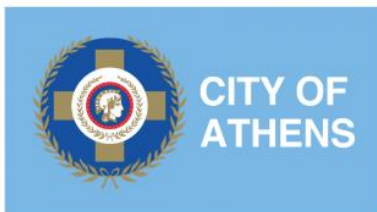
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The Greek urban system after 2010 in the frame of the European Union: structures, policies' implementation, resilience

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G01-O5 Urban, Regional, Territorial and Local Resilience, B5, August 28, 2025, 9:00 AM - 10:30 AM

The paper discusses the evolution of the Greek urban system and its constituent cities after 2010: during the periods of the Greek economic crisis, the covid-19 pandemic and Ukraine war, in the frame of the European Union (EU) territory. The paper also explores the resilience of this system seen in the frame of the policy of the EU and its strategy towards a Green and Digital future. Emphasis is given to the major cities of the urban system. The paper uses, among other things, data from the 2021 population census, which significantly enhances the evidence of the research work.

Our basic position is that, in the period under review, the Greek urban system was significantly transformed under the influence of exogenous and endogenous economic and social changes and especially of the Community policies for Greece.

Specifically, the following issues are examined: (α) the changes in Greece in the period under review in the context of the evolution of the European Union and its policies for Greece. (b) The evolution of the structure of the national urban system as well as of the structures and the roles of its constituent cities. (c) The specific change of the sectors related to the Greek cities' smart, inclusive and green development (d) The urban system inability to enough support the health system during the Covid-19 pandemic (e) The expected implications of the EU strategy and policies towards recovery and a Green and Digital future to the Greek urban system (f) Proposals for a Greek urban system' strategy and key actions in order to utilize the new policies to upgrade and contribute to the smart, green and inclusive development of the country.

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Regional Science In Turbulent Times - in search of a resilient, sustainable end inclusive future

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The Greek urban system after 2010 in the frame of the European Union: structures, policies' implementation, resilience

Panteion University / Regional Development Institute Athens, Greece
Zappeion Megaron, 26-29 August 2025

1. Introduction

The paper discusses the evolution of the **Greek urban system (US)** in the frame of the European Union, **after 2010**, during the recent **“poly-crisis” period**. We focus on the US' **major cities** which determine to a very large extent the structure of the system.

We need to emphasize from the beginning that the cities and the urban system of a country play an important role in its (sustainable) development at all spatial levels. Consequently, the policy for regional centres and for the urban system as a whole is a very important part of the overall spatial development policy.

Our **basic hypothesis** is that, in the period under review, **the Greek urban system was significantly transformed** under the influence of important exogenous and endogenous economic and social changes and especially the changes of **the Community policies during the “poly-crisis” period** (including the periods of the Greek economic crisis, the covid-19 pandemic and Ukraine war).

Specifically, the following **issues** are examined:

(a) the new roles of regional centres and urban systems on sustainable territorial development

(b) the **changes in the country** in the period under review as well as the **changes of the structure of the national urban system** and the roles of its major cities¹. We focus to some extent on the specific changes of **the Greek cities' smart, inclusive and green development**

(c) the impact of the **European Union' changes during “poly-crisis”** as well as of the EU **policies** that have been implemented. We discuss, among other, in more depth: (b1) The Greek US inability to enough support the **health system during the Covid-19 pandemic** (b2) The expected **implications to the Greek Urban System of the EU strategy (and policies) towards recovery and a Green and Digital future**

Finally, we make **proposals** for a Greek urban system' strategy and key actions in order to utilize the EU policies for recovery and resilience towards a green and digital future.

Our **hypotheses / questions** for this work are:

¹ We note that the paper uses, among other things, the 2021 Greek population census' data, which significantly enhances the evidence of the research work.

Generally speaking, sustainable development of European regional centres is related to the achievement of **balanced** competitiveness, cohesion and sustainability **in the entire EU area** as well as to **polycentric development at all spatial levels**: EU, transnational / national, regional / local.

Since globalization and networking among urban centres have intensified significantly after 2010, at global level and even more so at EU level, we should pay great importance in the way *the Greek Urban System is integrated into the European space* and mainly into the EU Urban System.

Regarding the **methodological approach**: The analysis of the six cities and the National Urban System prioritise the identification of **drivers of change of the urban system**. For the identification, we use, apart from the qualitative analyses, proper *indicators*. Since the urban system is a multi-level and multi-dimensional concept, the use of indicators, even composite ones, could only give a partial explication of the urban system changes. In other words, the use of indicators for specific analyses of one or more dimensions (but not all) of the US are very useful and have been used in the present work. In the same line of thoughts, we can say that the econometric models which have been developed fail to give a global analysis of the Urban Systems changes, while they can give useful sectoral insights.

2. The new roles of regional centres and urban systems in territorial development

Regional centres and urban systems play in our days an important role in supporting development in all territorial levels: national, regional and local.

Urban digital economy and the triple helix

Of primary importance in this respect is the development of *urban digital economy*. Digital economy is related to the dissemination of a wide range of Information and Telecommunications technologies (IT) across the economy and society. In the last decades, digital technology has transformed entire economic sectors, such as transport, health, media, retail and construction; it has also changed work and lifestyles.

Important role in the development of the digital economy and innovation in urban poles plays the existence of relevant businesses and universities, as well as the support from the local authorities. The cooperation between companies, universities and local authorities in these areas creates a kind of "*triple helix*" that promotes overall development - see, among others, in (Angelidis 2018)

Regarding **metropolitan areas**, strong point of this contribution is the comparatively stronger development of research and technology, especially digital technology.

Here we consider it useful to emphasize *the role of medium-sized regional centres*. Small and medium-sized cities *can be drivers of the development (or the recovery) of their country, because they could more efficiently promote production and innovation* – as well as social inclusion and environmental sustainability. Briefly, the medium-sized regional centers should prioritize the development of new economic activities, exploiting, inter alia, their endogenous potential, emphasize "bottom-up" development and, above all, support the "new economies" (or "new economy").

ESPON's recent final report on small and medium-sized cities highlights their role as "mediator" places that can reduce territorial imbalances if policy supports connectivity, local assets and place-tailored strategies. (ESPON 2023).

However, small and medium-sized cities can achieve these **only if they act in the frame of a well-prepared spatial development plan**. Cities with low levels of organization and planning fail to derive economic potential, social inclusion and environmental sustainability. In other words, they don't take advantage of their existing potential.

Contribution of cities and urban systems in sustainable development and the UN Sustainable Development Goals (SDGs)

We should also stress here that the potentially very positive role of the regional centres and urban systems is acknowledged by the UN SDGs. Specifically: The *UN Sustainable Development Goals (SDGs) address the urban system primarily through SDG 11: Sustainable Cities and Human Settlements*, which aims to *make cities inclusive, safe, resilient, and sustainable* (United Nations 2020)

However, the urban system also intersects with all 17 SDGs, incorporating targets related to affordable housing (SDG 11.1), clean air and water (SDG 6), sustainable transport (SDG 11.2), and climate change mitigation (SDG 13). Effective urban policymaking and planning, led by bodies like UN-Habitat, are crucial for implementing the SDGs and transforming cities into hubs of innovation and sustainable development.

3. The Greek Urban System: structure / levels, roles / contributions

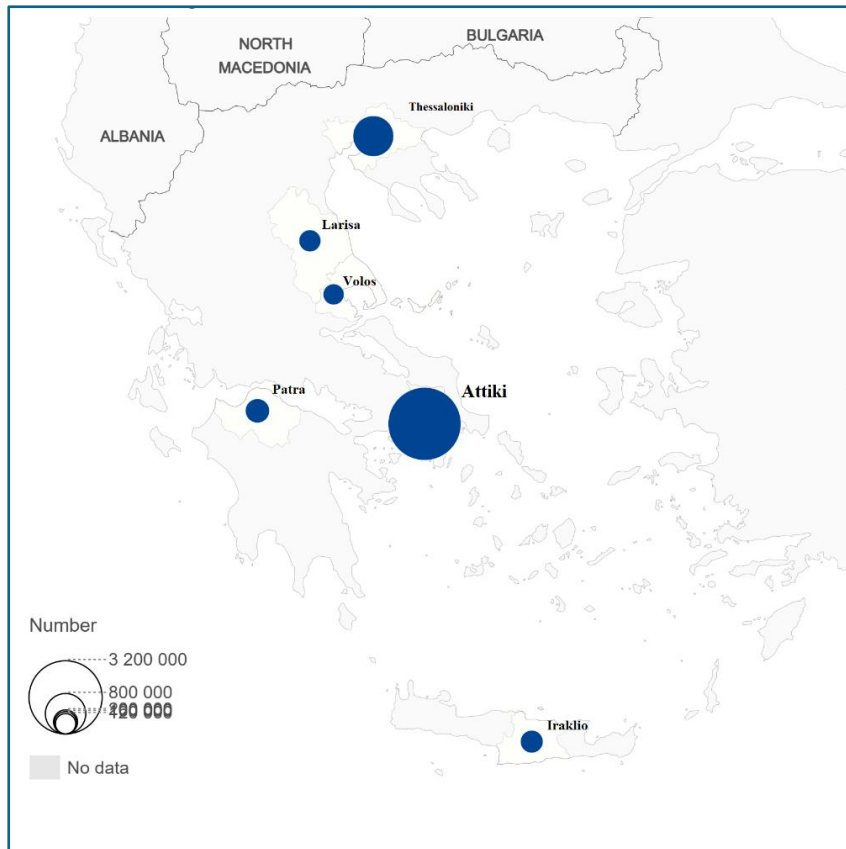
Excluding smaller cities / settlements, the Greek urban system consists of *two large metropolitan areas: those of Athens and Thessaloniki* and four medium-sized regional centres: *Patras, Heraklion in Crete, Larissa and Volos* (Map 1). We consider all six as "**major Greek regional centres**". We remind here that we focus on these centres. Firstly, because examining all the Greek cities would require a much larger investigation. But mainly because the above centres have a dominant position in the evolution of the Greek Urban System as well as on the territorial development of Greece (Angelidis – Karka 2001), especially in the period we are considering here - after 2010.

The large metropolitan areas (MA): Athens and Thessaloniki

Greece has a highly centralized urban system, dominated by the MAs of Athens and Thessaloniki. MA of Athens (Attiki) alone houses nearly four million. Furthermore, the two MAs have a highly prominent role in the country's economic and territorial development, including in the production and research – innovation, finance, administration, transport and other infrastructures, services provision system.

The medium-sized regional centres

The Greek medium-sized regional centres have the potential to play the developmental role described above. Some of them have moved in this direction, but the rest, however, have not taken advantage of the corresponding possibilities. We will discuss this topic in the following.



Map 1: Population of the six major Greek cities 2021
 Source of data Eurostat - Elaboration of map: M Angelidis

Networking among regional centres – development axes and territories, specific territorial categories: island, coastal and mountainous areas

In the past, the creation of the two national road axes: Athens - Thessaloniki and Athens - Patras, intensified the development axis Patras - Athens - Thessaloniki - Kavala. On the other hand, the lack of adequate interconnection between the North-West and North-East parts of the country was covered by the creation of the Egnatia motorway: Igoumenitsa - Thessaloniki - Alexandroupolis as well as other smaller road connections in the West-East direction. Also, the lack of adequate connection between the northwestern and southwestern parts of the country was covered by the creation of the Ionian Road and its extensions. So, today, the entire upper urban system of the country is more balanced.

The urban system in the special categories of areas: island, coastal and mountainous, despite individual improvements that have been made, is still weak, with the result, as we will see below, that it cannot adequately support development and social interventions that were considered necessary in many cases – such as e.g. to be able to contribute dealing with the covid-19 pandemic in island and mountainous areas.

Some notes on the developmental role of the six major regional centres

- **Athens:** Administrative, finance, transport hub
- **Thessaloniki:** Port + university + North Greek gateway
- **Patras:** Port and tech university

- **Heraklion:** Tourism + emerging energy hub (interconnector)
- **Larissa:** Agrifood base
- **Volos:** Port / industry + proximity to agrifood

4. Changes of the Greek US after 2010 - mainly during the poly-crisis period.

In particular, the **changes in the network of the six major Greek regional / urban centres mainly in the decade 2011-2021**, which interests us the most, are as follows:

Changes in the population potential

The population of Greece decreased during the decade 2011-2021 overall by -3.09% (Table 1) - a small decrease which however came after several decades of national population increases. The population decline would be even greater if the emigration of a significant number of young people abroad was not balanced by emigration to Greece.

Table 1: Population changes 2011-2021 in Greece and the six major urban centres*

	Population Census (C)	Population Census (C)	Population Census (C)	Population Census (C)	2011 - 2021	2011 - 2021 %
	17/3/1991	18/3/2001	16/3/2011	22/10/2021		
Athens	3.170.075	3.343.735	3.168.846	3.146.164	-22.682	-0,72
Thessaloníki	783.151	83.682	806.635	802.392	-4.243	-0,53
Patras	176.047	193.885	195.265	196.937	1.672	0,86
Larissa	11.809	131.095	144.651	146.374	1.723	1,19
Volos	118.637	127.887	130.094	127.441	-2.653	-2,04
Irákleion	133.643	149.038	157.452	162.600	5.148	3,27
Total Greece	10.223.392	10.934.097	10.816.286	10.482.487	-333.799	-3,09

*The resident population of Athens, Thessaloníki, Patras, Larissa, Volos and Irákleion according to census results.

Source of data ELSTAT, data process and table syntax: M. Angelidis

We see: (a) A considerable population *decrease* for Volos (-2.04%), small population decrease for Athens (-0.72%) and Thessaloniki (-0.53%) (b) A considerable population *increase* for Heraklion (+3.27%), smaller increase for Larissa (+1.19%) and Patras (+0.86%).

The percentage of the population of the six cities in the total population of the country increased slightly in the decade 2011-2021.

According to data analyses relating first of all to “Research – Innovation – Development” as well as to various sectors of activity, transport, etc., the overall influence of the six cities in the country as a whole, which was already very large, increased slightly.

5. The impact of the EU and its policies' changes on the Greek Urban System in “poly-crisis” times

The meaning of “poly-crisis”

What “poly-crisis” does it mean? In our view (Angelidis 2025), a polycrisis is a “dense matrix of **interlocking and mutually reinforcing disorderly processes in world politics...**». These crises “operate in terms of different logics and have distinct origins. But *they overlap and synchronise, not just temporally, but also politically, economically, socially and culturally*. Consequently, and importantly, these crises amplify each other through feedback loops...”

Polycrisis is often analyzed as **a set of interplaying challenges**: the high cost to tackle the climate crisis *making the green transition difficult*, the “Culture wars”, the “actual wars, seen most obviously in Russia’s invasion of Ukraine, *the attacks to democracy and the rise of authoritarianism*, a new wave of technological change -*especially ‘artificial intelligence’, the return of inflation and a near-zero development rate in EU*.

The EU policy evolution during “poly-crisis”

The different crises that occurred during the “poly-crisis” had important effects on the overall economy and society at world level but also at EU, national and regional / city levels. To face these crises, starting by the Covid-19 pandemic one, EU countries agreed to implement a radically new policy for the recovery and beyond. The core element of this policy was a €750 billion temporary recovery instrument called “NextGenerationEU” (followed by the Recovery & Resilience Facility (RRF)) “to help repair the immediate economic and social damage ...”. More interesting for us: they stated that “post-COVID-19 Europe will be greener, more digital, more resilient and better fit for the current and forthcoming challenges” (European Commission and Parliament and Council, 2021) (Recovery plan for Europe). It is important to mention that NextGenerationEU implementation facilities prioritize “Green” and “Digital”, supporting the European Green Deal and the Digital Transformation “as the twin transition to recovery”. See, among others, in (Angelidis – Drakouli – Tsigkas 2024).

Greece’s NRRP / “Greece 2.0” (EU 2021 and 2023) channels big investment and reform priorities through RRF. At the same time, the *EU Cohesion Policy* (European Commission 2023) *is being implemented through the Structural Funds* (ongoing finance for infrastructure, human capital and regional competitiveness). *European Green Deal* (European Commission 2019) / *REPowerEU* (European Commission 2022) / *Just Transition* constitute a strong push to decarbonise, improve energy security and finance transitions away from fossil fuels. Finally, Digital, Strategic & Security Orientation linked to increased EU focus on digital resilience, economic security, and strategic infrastructure.

Short conclusion

EU policy evolution - from massive one-off recovery funds (NextGenerationEU) to longer-term strategic instruments (Green Deal, Just Transition, REPowerEU, Cohesion policy reforms) - gives Greece an unprecedented toolkit to strengthen its urban system. The net effect in “poly-crisis” times will depend less on the total

money and more on (a) how equitably it's distributed across cities, (b) whether medium cities get the technical capacity to absorb and implement projects,

6. Strategies and actions to reinforce smart, inclusive and green development of the six cities – policy evaluation

What's actually changing in Greece's major cities as they become smarter, greener and more inclusive

Here's a concise, evidence-backed run-through

Athens (biggest shifts: citywide digital/green upgrades + Ellinikon)

- *Systemic funding & reform*: national recovery funds and Greece 2.0 direct money to digitalisation and sustainable urban investment that underpins municipal projects in Athens.

Thessaloniki (transport + climate resilience + data)

- *Major transport boost - Metro & mobility*
- *Waterfront regeneration & climate adaptation*: large waterfront redevelopment and municipal infrastructure programmes aim to make the city climate-neutral, increase accessibility and create more green public spaces.
- *Citizen participation & inclusion*: the city runs participatory workshops and pilot so local voices shape adaptation and social inclusion measures.

Patras (digital platforms, energy pilots, open data)

- *Open digital infrastructure and e-government pilots*: Patras is running pilots for open data platforms, smart power meters, smart lampposts and municipal e-services to improve service access and inclusion. These pilots are part of EU smart-city cohorts
- *Energy and public-service pilots*: smart metering and local energy experiments (as part of Greek pilots of EU projects) increase resilience and allow disadvantaged households to be targeted with social tariffs or efficiency upgrades.

Heraklion (urban greening + local strategies)

- *Urban green expansion*: Heraklion's smart-city programme explicitly prioritises increasing m² of public green per resident, urban tree planting, smart irrigation and climate-adaptive public space designs to reduce heat stress.

Larissa, Volos

- *Distributed, practical smart changes*: they are installing smart streetlighting, environmental sensors, smart bins, digital citizen services and smart mobility / pedestrian-zone management

Short assessment: impact and remaining gaps, role of the six major cities in the Greek urban system

- **Impact**: projects are moving from pilots to large, visible transformations (Ellinikon, Thessaloniki metro, municipal digital platforms). They deliver greener public space, lower-carbon transport options and more accessible e-services. Specifically, for the Ellinikon project, see next.
- **Gaps/risks**: equity of benefits (who gets the new housing/jobs/tourism gains), long-term operations (maintenance of smart infrastructure), and coordination between national funds, municipalities and private developers remain big

challenges. Local citizen engagement and transparent open-data governance will determine whether changes are truly inclusive.

Specifically, for the Ellinikon project: It significantly burdens the infrastructure of the wider area and has limited the green areas of its development area. It remains to be seen in the future whether the positive effects, especially on employment, will somehow balance this out.

Evaluation of the contribution of the urban system to the sustainable development of the country

In the context of this paper, it is of great importance to evaluate (based on the above) the role of the six large cities in the urban system, and the response of the urban system to the priorities of the National Spatial Planning as well as to the requirements of smart, inclusive and environmentally sustainable development. As far as the role of the six major cities is concerned, in the post-2010 period most of the (large) changes foreseen in the spatial plans were not implemented, partly due to the effects of the economic crisis faced by the country and partly due to the weaknesses of the governance system at all spatial levels (which remain, to a high extent).

In particular, the entire National Spatial Planning (NSP) has been poorly implemented. In essence, it has been "forgotten" in a way. The actions and interventions in the six cities (but also in the smaller ones) are carried out "piecemeal", "in the absence", to a large extent, of the NSP. Consequently, there are no "positive effects" from the coordination of interventions, from the implementation of the NSP (but also of the other, lower-level spatial plans).

An example of evaluating the contribution of the Greek Urban System to addressing spatial development problems: the support to the healthcare system during the Covid-19 pandemic

Next, we will proceed to an analysis of why the **Greek urban system** struggled to adequately support the **healthcare system during the COVID-19 pandemic**

1. Key Weaknesses Exposed During COVID-19

a) Overburdened Health Infrastructure

Public healthcare in Greece was *underfunded for years due to austerity measures* (post-2008 financial crisis).

The pandemic caused *ICU bed shortages*; before COVID, Greece had *fewer ICU beds per capita than the EU average*.

Centralized hospital systems meant *that rural and island populations lacked nearby facilities*, forcing patient transfers.

b) Urban Density & Mobility Patterns

Athens has *dense neighbourhoods and mixed-use development*, which *contributed to fast virus spread*

c) Governance & Coordination

Greece faced *coordination issues between central government, municipalities, and health authorities*.

d) Socio-economic Disparities

Informal housing and *overcrowded apartments in low-income districts* amplified risks. Tourism-dependent cities (e.g., Athens, islands) saw *economic pressure to reopen early*, undermining containment efforts.

2. Why the Urban System Was a Bottleneck

Centralized services → Overload in Athens and Thessaloniki hospitals.

Weak secondary cities → Could not absorb healthcare demand.

Transport dependence → Increased exposure in commuting.

Limited digital infrastructure → Slowed telemedicine adoption outside major cities.

Effects of the EU policies towards “Green” and “Digital” to the Greek Urban System

In next, we discuss only the territorial effects

the pressure to de-centralise vs continued Athens’s primacy

EU Cohesion policy and “Territorial Agenda 2030” support balanced territorial development and urban innovation. But large capital cities often capture a disproportionate share of investment and talent.

Implication for Greece:

- Opportunity to promote polycentric growth (regional capitals, second-tier cities) through targeted investments (ports, universities, green industry), but outcome depends on national/regional coordination and municipal capacity.
- If not managed, recovery + green/digital investments could reinforce Athens’s economic weight (higher rents, more jobs concentrated there).

Implication for Greek cities:

- Further expansion of metro/light-rail and bus modernisation (Athens already receiving big EU support)
- Stronger emphasis on SUMP (Sustainable Urban Mobility Plans), EV charging networks, bike lanes, and reduced car-centric investments.
- Short to medium term: construction disruption but long-term reductions in congestion, pollution and travel times.

Building stock renovation and local energy transition will reshape neighbourhoods

Renovation Wave / Green Deal funding aims to upgrade building energy performance and decarbonise heating/cooling. Greece’s Recovery plan includes green energy and building interventions (European Commission 2019) (Green Deal)

Implication:

- Large retrofit programmes in dense urban neighbourhoods → jobs, lower heating bills, but also potential increases in property values (gentrification risk).
- Need to pair retrofits with social measures (subsidies, tenant protections) to avoid displacement.

Faster digitalisation of services, industry and urban management — but uneven uptake

The EU Digital Decade sets concrete 2030 targets (digital skills, connectivity, public services) and Greece has specific country actions (5G coverage, AI Factory) (European Commission 2025)

Implication:

- Cities will adopt smart city platforms (traffic management, energy monitoring, digital permitting, e-health).
- Competitiveness boost for tech-savvy municipalities and local SMEs, but **digital divide** risk for older residents, small towns and islands unless skills and inclusion are actively funded.

6. Proposals for a Greek urban system' strategy and policy

In next, we give a practical, policy-aligned strategy for a Greek *urban system* that uses the country's recent policy instruments (RRF / "Greece 2.0", Cohesion funds, updated NECP, Digital Decade, national planning reforms and specific flagship projects) to deliver *smart, green and inclusive* cities and regions.

Strategic vision

Make Greek cities (including the six major ones) climate-neutral, digitally enabled and socially inclusive by 2030 - through integrated spatial planning, a low-carbon infrastructure roll-out, radical digitalisation of public services, inclusive housing & jobs strategies, and funding models that leverage EU Recovery and Cohesion instruments and private capital.

Guiding principles

1. **Territorial integration** - link national, regional and urban plans so metropolitan areas, medium-sized cities and smaller towns (as well as islands etc.) share objectives and funding.
2. **Policy alignment** — design projects that stack funding from Greece 2.0 (RRF), Cohesion/ESIF, EU Green Deal instruments and private finance.
3. **Place-based action** — prioritize locally tailored pilots
4. **People first** - measure social inclusion (access to services, affordable housing, jobs) alongside carbon and digital targets.
5. **Open, data-driven governance** - standardised urban data platforms for monitoring and citizen participation.

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