

# Make Cities Great Again

## AI exploration phase

## P2 - Building Hypothesis on AI

**AI and Exploration Topics.** What are we exploring?

**Robot in the city:** how our project could impact on the future

**SDG 11:** how to make cities more sustainable, with AI integration

**Practical approach:** understand by doing, creating AI models

**Materials Needed and to Create.** What must be prepared before the activity?

Analysis sheets (paper or digital) – *"AI Skill Tree"*

Python Notebook (Google Collab) – *"sdg11.ipynb"*

Pens / tablets / smartphones for note-taking  
Whiteboard or projector for collective analysis



**Exploration Steps and Description.** What do participants actually do?

### Step 1 – The Urban Blueprint: SDG 11 (Classroom – 60 minutes)

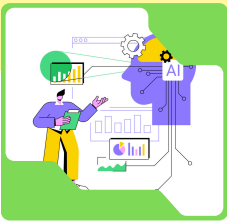
**Key Question:** How can we transform our cities into inclusive, safe, and green spaces for everyone?

**Suggested Facilitation Approach:** Open with a **"City Audit."** Ask students to describe their commute to school. Is it noisy? Is the air clean? Can a person in a wheelchair or an elderly neighbor navigate it easily? Introduce SDG 11: Sustainable Cities and Communities as the master plan to fix these urban challenges.

**Focus Areas:**

- **Target 11.2 (Inclusive Transit):** Discuss why transport must be "accessible." Why do women, children, and persons with disabilities need specific attention in city planning?
- **Target 11.4 (Heritage Protection):** Explore why safeguarding cultural and natural heritage is vital for a city's identity.
- **Target 11.6 (Environmental Impact):** Focus on air quality and waste. How does a city "breathe"?

**Activity: The Accessibility Map (20 min):** Students work in pairs to identify one "barrier" in their own town (e.g., a lack of bike lanes or high pollution zones) and propose a digital solution. Fundamental Clarification: A city isn't just a collection of buildings; it's a living system that requires data to stay healthy.



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## Exploration Steps and Description. What do participants actually do?

### Step 2 – The Robot's Senses: Hardware for Cities (Lab – 60 minutes)

**Key Question:** How does a robot "feel" the environment to help vulnerable citizens?

**Technical Framework:** Introduce the concept of Environmental Sensors. Just as humans have five senses, a robot uses electronic modules to gather objective data about SDG 11 targets.

The Sensor Array:

**Air Quality Sensor (Target 11.6):** Measures CO2 and particulate matter. Logic: If air quality is poor, the robot alerts sensitive groups (asthmatics/elderly).

**Microphone/Sound Sensor (Target 11.2/11.6):** Measures decibel levels. Logic: Identifying "noise pollution" zones that affect mental health.

**Temperature & Humidity sensor:** Monitors urban "heat islands." Logic: Ensuring public spaces are safe during heatwaves.

### Step 3 – Urban Inference: Testing the Robot (Lab – 45 minutes)

**Key Question:** How does our trained AI react to real-world scenarios?

**The Scenario Test:** Once the model is trained, students use the Inference section of the notebook to simulate a robot walking through different parts of a city.

**Activity:** The Scenario Challenge (30 min): Students input "New Readings" into the model to see the AI's confidence levels.

- Scenario A: A sunny park (Low noise, low PM2.5). Expected: **Livable**.
- Scenario B: A traffic jam (High noise, high PM2.5, high heat). Expected: **Not Livable**.
- Scenario C: A construction site. Expected: Not Livable (due to noise).

**Discuss:** Look at the Confusion Matrix. Where did the AI fail? Did it mistake a noisy park for a construction site? Why is "confidence" (the % probability) just as important as the final answer?



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**Expected Output.** What do participants create, produce or gain from the exploration?

**A "City Audit" Proposal:** A documented identification of a local urban barrier (e.g., lack of accessibility or high pollution) paired with a conceptual digital intervention.

**Data Literacy:** The ability to translate physical phenomena (heat, noise, smog) into digital values that a machine can interpret.

**Systems Thinking:** Understanding how Target 11.2 (transport) and Target 11.6 (environment) are interconnected—for example, how better public transit data reduces per capita emissions.

**Empowerment (The "Aha!" Moment):** Moving from the feeling of being overwhelmed by urban problems to the realization that they can measure, analyze, and propose solutions for those problems using logic and sensors.

**The Hook and the Playfulness.** What makes this fun/exciting for young people?

- **Relatability & Ownership:** By auditing their own city or school, the project stops being a textbook exercise and becomes a mission. They aren't just "students"; they are "Urban Designers" or "Digital Activists" solving real-world problems they see every day.
- **The "Cyborg" Perspective:** Instead of just reading **about pollution**, students give a robot "senses." Watching a screen react instantly to a **loud clap** (Microphone) or a **breath of air** (CO2 sensor) turns abstract science into a tangible, interactive game.

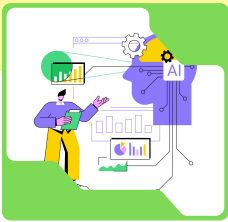
**Success indicators.** How do we know it worked? What shows participants learned?

## 1. The "Data-to-Action" Shift

- **Indicator:** During the Lab, can students explain why the **temperature** or **air quality matters** for a specific **vulnerable** group?
- **Evidence:** A student saying, "The sensor shows it's too hot here; this would be a dangerous 'heat island' for an elderly person under **SDG 11**," indicates a successful synthesis of tech and ethics.

## 2. Technical Autonomy

- **Indicator:** The ability to troubleshoot the "**Decision Boundary**" in the Neural Network experiment.
- **Evidence:** Students successfully running the **Python/Colab** script and correctly identifying how outliers (like an exceptionally tall woman or short man) challenge the binary classification model.



# Appendix - Example of material (duplicate if needed)

Appendix 1

Make cities great again

## Content of the appendix

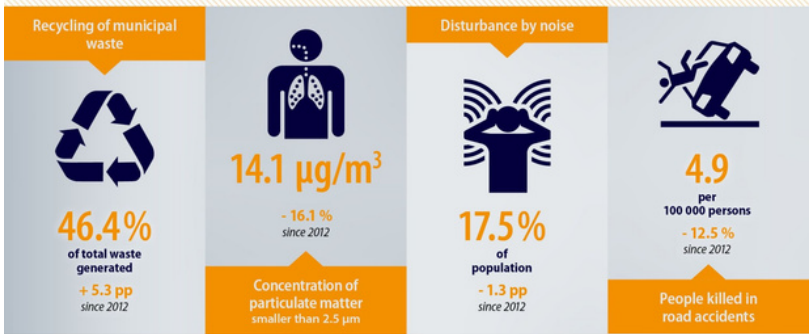
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### SDG 11 IN THE EU: SUSTAINABLE CITIES AND COMMUNITIES in 2017



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