



AI-GREENER

2024-1-AT01-KA220-SCH-
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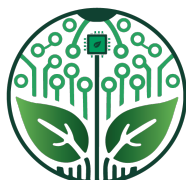
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LESSON PLAN

AI for Smart Cities: Optimizing Energy, Transport and Services

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Authors

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1. TITLE

AI in Smart City Transportation Systems

2. GRADE LEVEL

- ☐ ISCED Level 2 – Lower Secondary Education (ages 12–15)
- X ISCED Level 3 – Upper Secondary Education (ages 15–18)

3. SUBJECT AREA

- ☐ Sciences
- X Environmental Studies
- X Geography
- ☐ Economics
- X Computer Science
- ☐ Mathematics
- X Technology and Design
- ☐ Arts and Music
- X Social Studies
- ☐ History
- ☐ Languages

4. TYPE

- X Lesson Plan
- ☐ Project

5. DURATION

- X 1 x 40-50minute class
- ☐ 1 x 60-minute class
- ☐ 1 x 80-100-minute block
- ☐ 2 x 45-minute classes
- ☐ 2 x 60-minute classes



- Double session (2 × 60 minutes) optional project-based homework.

6. LEARNING OBJECTIVES

By the end of the lesson, students will be able to:

- **O1** – Explain how AI improves transportation efficiency and sustainability in smart cities.
- **O2** – Analyse real-world examples of AI-driven mobility solutions using data from traffic and public transit systems.
- **O3** – Evaluate the environmental benefits of AI in reducing congestion, emissions, and travel time.
- **O4** – Apply knowledge through an interactive matching activity identifying Smart City components.

7. Key Competences Developed

- Literacy
- Multilingual competence
- X Mathematical competence and competence in STEM
- X Digital competence
- X Personal, social and learning to learn competence
- X Citizenship competence
- X Entrepreneurship competence
- Cultural awareness and expression competence

8. Prior Knowledge / Prerequisites

Basic understanding of digital technologies, networks, urban mobility challenges and sustainability issues/ none specific required.

9. Lesson/Project Outline

Phase 1 – Introduction (Engage & Contextualize)

Purpose: Activate prior knowledge and set the context for understanding mobility challenges.

**Activities:**

- Introduce the concept of Smart Cities.
- Show the slides from SmartCity.pptx (slides 1–6 focusing on sustainable energy + transport).
- Guiding questions:
 - What makes transportation systems “smart”?
 - How can AI reduce traffic and pollution?

Expected Output: Students identify today’s urban transportation challenges.

Resource (name)	Link (to the folder on Teams)
SmartCity Presentation (slides 1–6)	AI for Smart Cities: Optimizing Energy, Transport, and Services (Slides) – in folder

Phase 2 – Exploration (Investigate & Compare)

Purpose: Deepen understanding of how AI technologies improve mobility and sustainability.

Activities:

- Students analyse slides 7–13 in pairs.
- Identify key technologies: predictive analytics, AI traffic lights, smart transit, autonomous shuttles.
- Compare traditional vs. AI-supported transport systems.

Expected Output: Students create a short comparison table summarising improvements from AI.

Resource (name)	Link (to the folder on Teams)
SmartCity Presentation (slides 7–13)	AI for Smart Cities: Optimizing Energy, Transport, and Services (Slides) – in folder
Worksheet “AI in Smart City Transportation Systems”	In folder



Phase 3 – Application (Hands-On Practice)

Purpose: Students complete an interactive LearningApps task.

Activities:

- Students match AI transportation components (smart traffic lights, sensors, EV infrastructure, etc.) to their functions.

Expected Output: Students demonstrate understanding of the role of AI in mobility optimisation.

Resource (name)	Link (to the folder on Teams)
LearningApp “Smart City Components and Their Functions”	https://learningapps.org/43369836

Phase 4 – Reflection & Consolidation (Present & Connect)

Purpose: Encourage students to reflect on how AI improves transportation and contributes to sustainability.

Activities:

- Students complete the 4-question reflection worksheet:
 - What are the main transportation problems that AI can help solve in modern cities?
 - How does AI help reduce traffic congestion and CO₂ emissions?
 - Which AI transport technology do you think is most beneficial for sustainability? Why?
 - How would your daily commute change in an AI-enabled smart city?
- Optional Activity:
 - Students share one answer with a partner or the whole class.

Expected Output: Students demonstrate understanding of the lesson by connecting AI technologies with mobility, efficiency, and sustainability outcomes..

Resource (name)	Link (to the folder on Teams)
Reflection Worksheet (DOCX)	In folder



10. Assessment Criteria

Method	Description
Completion and accuracy of LearningApps activity	Assesses students' ability to correctly match AI transport components with their functions.
Quality of comparison table (AI vs. traditional transport)	Evaluates how well students can distinguish traditional transport from AI-enhanced systems.
Clear, relevant answers in 4-question reflection	Checks students' understanding of AI's impact on mobility, emissions, and sustainability through written answers.
Active participation and collaboration	Measures engagement in discussions, collaboration, and contribution during group work.

Resource (name)	Link (to the folder on Teams)

11. Teaching Materials

Name	Type (Developed/Existing)	Link	Role in the lesson
AI for Smart Cities: Optimizing Energy, Transport, and Services (Slides)	Developed	in folder	Core visual material



Reflection Worksheet	Developed	In folder	Individual reflection
LearningApp “Smart City Components and Their Functions”	Developed	https://learningapps.org/43369836	Individual reflection
Worksheet	Developed	In folder	Individual reflection

12. External Resources and References

Resource (name)	Link (external or to the folder on Teams)
EU Smart Cities Marketplace	https://smart-cities-marketplace.ec.europa.eu/
European Sustainable Urban Mobility Report	https://transport.ec.europa.eu/