

Intellectual output 3. Educational support content targeting instructors

Learning sheets for HERA activities

Sustainable mobility

Topics: mobility, transportation, environment, pollution, sustainability

Introduction

Cities may experience traffic gridlocks as the result of the mobility being ensured mostly by private transportation. This also causes a lot of pollution in the city. Sustainable mobility ensured by green public and private transportation can solve many of these issues. Policies related to public and electric transportation vs. private transportation and infrastructures, including roads, buildings, etc., must be adapted to this new mode of mobility. That means creating bicycle and electric vehicles lanes, parking, public green transportation lanes, etc.

Context

The city major was elected to a city with a lot of gridlocks as the result of a mobility taking place mostly by private transportation. This is also causing a lot of pollution in the city.

Citizens are not happy!

Following are some suggestions for roles that students may undertake:

Role 1: Mobility manager

The mobility manager ensures that traffic flows swiftly in the city so that everyone can get to their destination easily and quickly. Therefore the mobility manager is responsible for the traffic infrastructure of the city. He also manages the public transportation system.

Role 2: Treasurer

The treasurer ensures that the changes to the city infrastructure and the maintenance of the public transportation system can be implemented within the existing budget.



Figure 1. The sustainable mobility scenario challenges students to design interventions that allow inhabitants to get easily to their destination.

Intellectual output 3. Educational support content targeting instructors

Learning sheets for HERA activities

Role 3: City mayor

The city mayor has the final word on policies related to public and electric transportation vs. private transportation and the supporting infrastructure: roads, buildings, etc. She must ensure that citizens experience easy mobility, preferably through clean transportation. Decisions need to take in consideration the season as in the winter few inhabitants will likely use bicycles or electric scooters. The city mayor is really keen on being re-elected, so she wants the inhabitants to be happy as a result of pollution reduction.

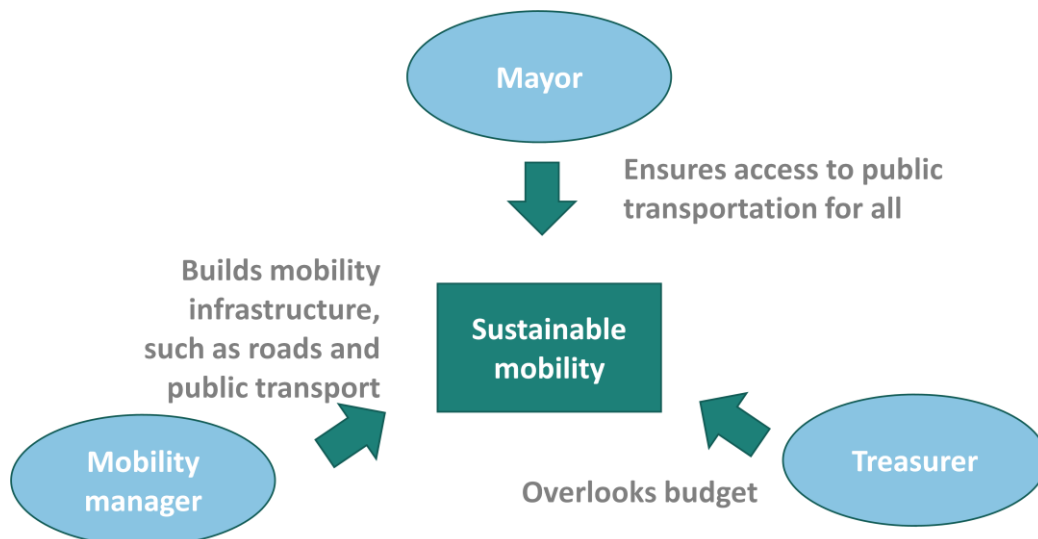


Figure 2. Roles, actions, and dependencies.

Learning goals

Upon completion of the activity students will:

- Understand the connections between environmental, social, and economic aspects of everyday life.
- Have experienced how to achieve cooperation between different parties with different goals and needs.
- Built competence in taking an integrative approach in researching city management and related environmental issues.
- Created the conditions necessary for navigating the challenges modern society and environmental changes pose for the public and private sector.

Intellectual output 3. Educational support content targeting instructors

Learning sheets for HERA activities

Prerequisites

The activity can be introduced to students with no pre-required information. Teachers can do a previous briefing about sustainable mobility options and strategies.

Audience

This scenario is suitable for students enrolled in broad engineering, economics, and management programs. It is closer to programs related to civil engineering but students enrolled in other engineering principles will not face any problems in implementing the scenario.

Core concepts

- **Sustainability:** Encouraging decision making in terms of environmental protection and the impact of human activities on their surroundings both short- and long-term.
- **Nature-based solutions:** Solutions to real-life challenges that are based on processes the functioning of nature.
- **Ecosystem services:** Services and systems that directly or indirectly benefit communities.
- **City management:** Managing the services, revenues, and expenses of a city.
- **Transversal skills:** Collaboration, critical thinking, analytical thinking, innovative thinking.



Figure 3. The scenario explores concepts of sustainability, effective mobility, city management, and pollution control.

Intellectual output 3. Educational support content targeting instructors

Learning sheets for HERA activities

Description of the scenario



Figure 4. Students are called to enhance a rich city that includes residential areas, industry, culture, and other services.

The overall purpose of the scenario is to allow students to experience the conflicts of interests and the difficulty of implementing changes when a major city aspect, such as mobility, has to be dramatically reconfigured with implications on infrastructure, for example roads, but also on the public transportation and on the individual way of thinking about mobility. It demands good collaborative skills, ability to

compromise for reaching common goals, critical thinking, and a good flair for optimizing decisions.

The scenario explores the full HERA game. Students use the communication and planning facilities in the game to discuss, negotiate, and agree on decisions that they can subsequently implement through the scenario simulation.

Participants can explore the consequences of their decisions and insights to what it means in real-life to work on complex decisions. The scenario is based on a non-trivial city design that includes rich enough facilities to allow meaningful decisions encouraging students to meaningfully engage in a complex discussions related to mobility issues. The starting city of the scenario may deploy a traditional mobility approach focused on private transportation which will lead to traffic gridlocks challenging students to introduce smart mobility enhancements. As an added difficulty, the starting city can include events that result in a lot of inhabitants converging to the same place at the same time creating specific mobility issues.

Suggested class activity

1. The teacher presents the problem to the class and introduces the scenario and game.
2. The students brainstorm in order to understand the problem and the parameters within which they have to work. This includes the available city budget, the city plans with the current mobility schemes and the restrains on what can be built.

Intellectual output 3. Educational support content targeting instructors

Learning sheets for HERA activities

3. The students are encouraged to come up with as many ideas as possible through brainstorming. Techniques of design thinking could be used for promoting innovative design and the introduction of a human-centered solution that address actual needs of city citizens.
4. The students are asked to jointly decide on the ideas to implement from the pool of suggestions that they came up with taking into account restrictions, such as city plans, budget, and commute patterns.
5. The teacher forms groups and gives students their roles in the game.
6. The students play the game according to their roles.
7. The students discuss the game results and their roles; the teacher gives feedback.

Assessment methods

This is a collaborative, open ended activity in which not a single solution exists. Self assessment is useful in this scenario offering students the benefit of taking responsibility of their learning. Students will discuss their roles within their group and reach a decision on whether they achieved their goal or not. Students may further present their solution to the entire class receiving evaluation from their peers. Finally, the class may decide on the more creative solutions among all teams.