



Energy Usage and Green Public Transportation in  
Future Smart Cities: An Innovative Teaching Program  
for Students, Stakeholders and Entrepreneurs  
n° 2020-1-TR01-KA203-094242



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**E-Newsletter/ 07**



# **Energy Usage and Green Public Transportation in Future Smart Cities:**

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# Detail info about Module 6

## Module-6

### ***“Information Systems and Technologies for Green Public Transportation”***



The course will provide participants with the overview of technologies and information systems across various green public transportation modes, whether these are used by pedestrians or integrated in bicycles, buses, and rails. Learners will be introduced to innovative and underlying concepts and technologies, in particular - cloud computing, big data, Internet of Things (IoT),

and artificial intelligence, that enable public sector organisations to adapt to climate challenges and that lead to changes in organisational processes, operating models, and ways of providing services (Mobility as a Service, MaaS) to the general public. They will be given an opportunity to discuss the collection, sharing, integration and control of data derived from related information systems, as well as the potential for data analytics processes, development of prediction models, and tools for visual analytics. Upon reviewing real-life case studies provided by the industrial partner, learners will be supported in developing their decision support models that could ensure a better quality of service delivery and increase efficiency and effectiveness of green public transport.

## Introduction

The Scenario Exploration System (SES) is an interactive game released under a Creative Commons license that engages participants in systemic and collective reflection through building different scenarios. It was designed by the Joint Research Centre of the European Commission and is maintained by its Competence Centre on Foresight (European Commission, n.d.b). There are several adaptations of the game, one of which is used to discuss the future of mobility from different perspectives. The scenario titled “Future Mobility SES” edition was designed in an event titled “mobility is a serious game” in 2017, and is available for download online (European Commission, n.d.a).



## Information Package

The future of mobility scenario game includes the board, different cards representing megatrends, uncertainty and actions, tokens in 5 different colors, cube/die (instructions, board and cards). The complete package is available from the Competence Centre on the foresight website (European Commission, n.d.a). It also includes participant's Record Sheets and the Score Sheet.

## Game Playing

Depending on the number of course participants, a single or two SES games should be prepared before class. Each game should have a minimum of 5 participants and up to 15 as a maximum. For example, in case there are 10 participants, the alternatives are: a) organizing 2 tables for 2 SES games that will be played separately but simultaneously in the same classroom, or b) organizing a larger table for a single SES game where 5 roles are distributed between pairs (total of 10 participants). First 20 minutes are planned for introducing participants to the foresight gaming system (SES) in general, stating that European Commission's Joint Research Centre developed the tool and explaining that the scenario's purpose is to engage different stakeholders in systematic future thinking on a specific topic with a long-term perspective to explore alternative futures. General rules (possible scenarios, player roles, procedure, scoring) are also presented.

Then, in the next 20 minutes, the Scenario master (instructor) offers four possible scenarios to be played, and participants choose one. The possibilities are:

- 1) Autonomy Drives All,
- 2) Climate measures get tough,
- 3) Transport moving the masses and
- 4) Innovation is our business model.

The details of the scenario are written in scenario details cards. The instructor can choose the scenario instead of the learners, having in mind learning outcomes. After choosing the scenario, participants decide on their roles: National Government, Local Government, Business, or Non-Governmental Organisation (NGO). A fifth participant plays the role of the Public Voice analyzing the actions of the participants, giving feedback and scoring the actions of the four scenario explorers (i.e. participants – students, entrepreneurs...). The instructor introduces them to the Record and Score sheets, and tokens. The appropriate number of action cards and resource tokens are handed out to the participants.



Then, 60 minutes are planned for Rounds 1, 2 and 3. At the beginning of the session, the start year is set (e.g. current year or 2025, etc.). If the current year is set as a starting point, Round 1 represents the near future, i.e. what will happen in five years; Round 2 represents what will happen in ten years and Round 3 twenty years. If some year in the future is set as a starting point, Round 1 represents what happened up to that point; Round 2 is what happened ten years from today and Round 3 is in twenty years. The instructor can set the year or let the participants choose. The instructor gives participants a few minutes to choose a role and explain their choice to others and the long-term vision (where their organization will be in 20 years?). The business should have a clear business plan, location, size, market, and suppliers. The NGO must specify its scope, objective, and membership details. The national government must specify its government department; the local government must be the city government or similar authority responsible for local transport. The Public Voice chooses its profile (socio-economic positioning, political opinion, aspirations, etc.) and perspective/philosophy. At the beginning of each round, corresponding detailed scenario cards are shown by the instructor explaining what will happen or had happened in 5 or 10 years. All participants except the Public Voice pick two Real Life cards that they keep secret, and the Uncertainty Card is shown. All participants roll the die (not the Public Voice), and the highest score plays first, the others in an order descending according to their roll of the die (6 goes first, then 5 etc.). Participants get 3 min to define what action they want to take (based on given Action Cards). They write on their record sheet what their action is and how many tokens they use to support it. They then have 2 min to place their Action Card and corresponding RTs on the board and give a verbal explanation for the action. Public Voice explains its opinion on each action and its overall perspective on the situation and distributes future impact tokens. Then, real life cards may be used (though not required). Some can be used earlier (see specific instructions on the cards).

Scores are calculated by the instructor after all Real Life cards have been used, and she/he records the scores on the record sheet. The explorers that have used a Real Life card pick a new one, so they hold two at the start of every round.

Round 2 begins by revealing a new Uncertainty that will affect this round. The previous one is placed at the bottom of the pile. The instructor describes briefly what happened in Round 1, and then reveals and builds a story based on the 10-year Scenario Detail cards. All explorers roll the die, following the same logic as in the previous round. They then repeat the same process for defining their action, recording it, and deploying their resource tokens. They then have to explain their action as per Round 1. The news is that the explorers who want to collaborate invite others to do so when it is their turn. The invited explorers who accept to collaborate put Resource Tokens on the corresponding action(s). The turn is now on Public Voice which explains its opinion on each action, and its overall perspective on the situation



situation and distributes Future Impact Tokens. If there is an interest Real Life cards are used. Scores are calculated and recorded in the attached sheets and Real Life cards are replenished if used in this round. Round 3 starts again by revealing new Uncertainty for this round and the instructor describes what happened in the previous round following the revealing of new 20-year Scenario cards. The same procedure follows: rolling the die by explorers, taking and recording actions, scoring by Public Voice, using Real Life cards and calculating the final scores.

The last 20 minutes are used to summarize the events that happened over the three rounds and sum the scores of all explorers. Collective assessment is made if the explorers achieved their objectives and if these events could bring us to a sustainable future. Challenges faced by participants are discussed as well. There does not have to be necessarily a winner in each scenario game – this is the instructor's decision. Group conversation at the end of the game takes place to reflect on the experiences everyone had during the game. Some questions can be; Do the stories that were created make sense? What did you learn from the session? How has it changed your mind on a specific issue? How would it be different with a different audience? Who should play this game if we were to do it again? Does it make you feel more or less confident about the future? Record sheets can be collected and analyzed further later.

## Case Study

In May 2021, two train-the-trainer workshops were organized so that future teachers and associates could get a better understanding of the foresight game Scenario Exploration System (SES). The participants confirm that the original purpose of the serious game can be achieved with participants from different backgrounds (information system development, business, urban development and so on), i.e. the game engages participants in systematic thinking with a long-term perspective and motivates them to explore an alternative future on specific issues and topics. There are many versions and adaptations of the SES game, and the team tried out, in particular, the following: 1) Mobility is a serious game, 2) EU innovation and 3) Operation Sustainability: The city greening game. The participants were led by the Scenario master Ivana Ninčević Pašalić and played a specific scenario within the Operation Sustainability game where the main theme of sustainability was improving the quality of life in Split. Participants were given different roles in the scenario "City for us" (representatives of the City, representatives of the Ministry, representatives of the business sector and civil society and the voice of the people) and made many interesting decisions and activities through a scenario of 20 years. The workshop is an introduction to future work with students and other stakeholders and to raising awareness in general about the importance of anticipation in the strategic thinking of public policies and decisions. The working atmosphere and the detail of the game board are illustrated in Figures 1 and 2 respectively.



*Photography from the SES workshop*



*SES gameboard detail*

## Conclusion

The objective of SES is to facilitate the application of future predictions in the area of public policy-making. The SES is designed to engage different stakeholders in systematic long-term thinking and to explore alternative futures for particular issues on a variety of topics (in less than three hours). The four characteristics of the tool are versatility, a wide range of potential users, the ability to interact with a wide variety of participants and circumstances, and adaptability (Bontaux, 2020). Once the first pilot of the program is organized, the feedback from the participants would be collected and analyzed to devise conclusions and plans related to using SES in the context of the program and wider.

## References

- Bontoux, L., Sweeney, J. A., Rosa, A. B., Bauer, A., Bengtsson, D., Bock, A-K., ... Watson, R. (2020). A Game for All Seasons: Lessons and Learnings from the JRC's Scenario Exploration System. *World Future Review*, 12(1), pp. 81-103. 2)
- European Commission (n.d.a) Future Mobility SES edition [https://knowledge4policy.ec.europa.eu/foresight/future-mobility-ses-edition\\_en](https://knowledge4policy.ec.europa.eu/foresight/future-mobility-ses-edition_en)
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## Info about module 4 lecturers:

### Maja Ćukušić

is an associate professor at FEBT's Department of Business Informatics in Croatia. Before employment at the University of Split, she worked for three years in a Dutch company and was involved in the design and implementation of complex ICT solutions for domestic and foreign markets. She is the manager of the project financed by Croatian Science Foundation (User-oriented process (re)design and information systems modelling – a case of smart city services) and the key expert for e-learning in the SEA-EU European University Alliance. In her teaching (courses OLAP systems, ERP systems, E-business), she covers studies on different business intelligence technologies, visualization tools (open data), and smart devices etc.



### Ivana Ninčević Pašalić

is a research and teaching assistant at FEBT's Department of Business Informatics, and a PhD candidate at the University of Split in Croatia. She teaches lab classes for the courses Multidimensional Information Systems and Management of IT projects. Her previous working positions include being Internal Auditor for a US based international organization and Operations Manager at a Croatian private company. She is also a member of the research team of MIS4SC project. Within the framework of the project, her research is focused on G2C and C2G interactions in smart cities, with a special focus on citizen engagement via different information and communication technologies.







## Silvia Golem

graduated from Faculty of Economics, Business and Tourism Split, University of Split in Croatia. She obtained her MSc and PhD diploma in Economics at Staffordshire University, Stoke-on-Trent (UK). At the present time, she is employed as an

associate professor at Faculty of Economics, Business and Tourism Split, University of Split where she teaches different courses: Methodology of Economic Research, Urban Economics, Spatial Economics and Macroeconomic Planning. She actively participates in scientific projects mainly related to urban and public economics. Her field of interest, within which she publishes scientific papers, includes public economics, econometrics, urban economics, and smart cities.



## Tomislav Križan

is a CEO & AI Evangelist at Atomic Intelligence Tomislav plays with data for a long time in every possible and impossible way. First Big Data project was on account-tickets in a bookkeeping service (low tech approach). Where the most see just numbers and letters, he finds a purpose and information. For a while now he is playing on a field of AI/DL/ML models for business purposes, with the last couple of years having a spotlight on text analytics, NLP (unstructured datasets) and applying ML models where they were not used before.







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