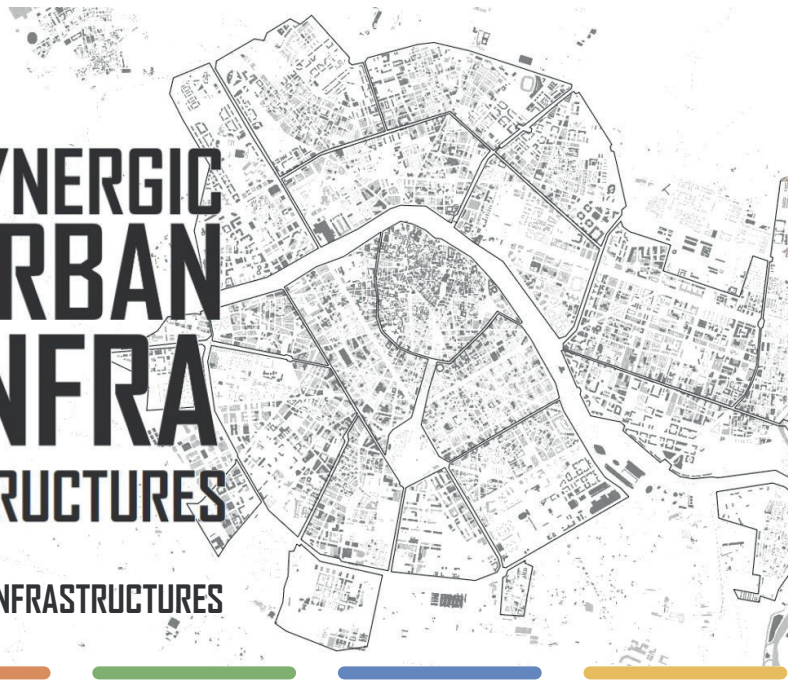
VLC SYNERGIC URBAN INFRA STRUCTURES



VALENCIA SUMMER SCHOOL ON SYNERGIC URBAN INFRASTRUCTURES

Editors: Juanjo Galan Vivas | Luis Bosch Roig

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3.1.1. Introduction

The VLC_Summer School aimed to explore a critical issue in urban planning education: How can we promote integrative thinking and practice in an increasingly specialized world? To address this issue, it was decided to create a conceptual and operational framework inviting the students to explore connections between different urban infrastructures (or systems) and, later , to use those connections to support their planning and decision-making processes.

During the VLC_Summer School, the concept used to promote integrative and relational thinking in urban planning was that of synergies, understood as the expanded benefits (1+1=3) that can be obtained by working together with two or more urban infrastructures (green, blue, mobility, social, housing, and energy in this specific case). Synergies were therefore associated with win-win solutions or positive correlations. They were never intended to be a planning method but a tool or instrument to improve the planning process by thinking simultaneously about different urban systems.

The procedure to design such a synergy-oriented tool (or synergy-meter) and its final form was left to each team. Most of them decided to start by identifying good performance indicators for each urban infrastructure, and in a second stage, to analyze their dual interactions through matrices or their multiple interactions through more multidimensional diagrams (e.g. network diagrams). The exercise was conducted using both qualitative and quantitative indicators for each urban infrastructure and their interactions. During the process, the students could discover positive correlations or connections between urban infrastructures and apply this knowledge to propose different types of (spatial) actions. Interestingly, many teams concluded that, to operate in an integrative way with synergies, it was necessary to formulate new types of crosscutting indicators combining aspects relevant to several infrastructures.

During the third and last task, the students used their synergic model or synergy-meter to support the definition of a spatial strategy for the sustainable evolution of the pilot site. The interest and value of the spatial strategies proposed by each team were assessed according to their capacity to generate synergies between their green, blue, energy, mobility, social and housing infrastructures.

The post-course analysis of the synergy-based methods proposed by the students was conducted in an online seminar on the 22nd of February, 2024. The seminar was attended by the following tutors and teachers of the VLC_Summer School: Stefano Salata (Politecnico di Milano), Fabio Bayro Kaiser and Christian Larisch (RWTH Aachen University), Mrudhula Koshy (Norwegian University of Science and Technology), Maciej Lasocki and Kinga Zinowiec-Cieplik (Warsaw University of Technology), and Luis Bosch and Julia Deltoro (Polytechnic University of Valencia). The seminar was organized and facilitated by Juanjo Galan Vivas (Polytechnic University of Valencia) and was also attended by Martina Schretzenmayr (ETHZurich) as an external observer.

3.1.2. Synergic methods for planning proposed by the students

Team1

In contrast to other teams, team 1 followed an inductive method to identify potential synergies between urban infrastructures. For that purpose, they started analyzing and mapping synergies within the pilot site (Figure 3.1.1). These synergies were analyzed more in detail through a matrix and through a series of spider webs linking each urban infrastructure with the others (see Figure 3.1.2). Later on, a set of six super-synergies was distilled and used as a connector between the goals defined by the team for the site and their design strategies (Figure 3.1.3). These six super strategies were associated with quantitative and qualitative indicators that were then used to evaluate the quality of the proposed spatial plan (Figure 3.1.4).

In the post-course seminar organized by the tutors to analyze the results of the Summer School it was raised the difficulties that the students from Team 1 found in conceptualizing and operationalizing the synergy concept and the importance that the definition of hyper or super synergies had to making the synergy-tool more manageable during the planning process. Besides, the use of maps and the location of the interactions between infrastructures in the pilot site were helpful for the students in connecting the synergy concept with a physical reality. Interestingly, this approach led to an 'inductive' approach in which mainly the positive interactions that were intuitively detected on the site were incorporated into the list of synergies. During the post-course seminar, it was also indicated the importance of some graphic tools (e.g. spider graphs) to visualize and synthesize information. In the same line of thought, the freedom to explore visual tools was also highlighted by different tutors as one of the main strengths of the course since it facilitated the development of relational and integrative skills. During the seminar, it was also commented that a preliminary definition by the students of a clearer work process could facilitate the workflow (critical in such an intensive course) and guarantee a stronger connection between inputs (synergies) and outputs (spatial proposals).

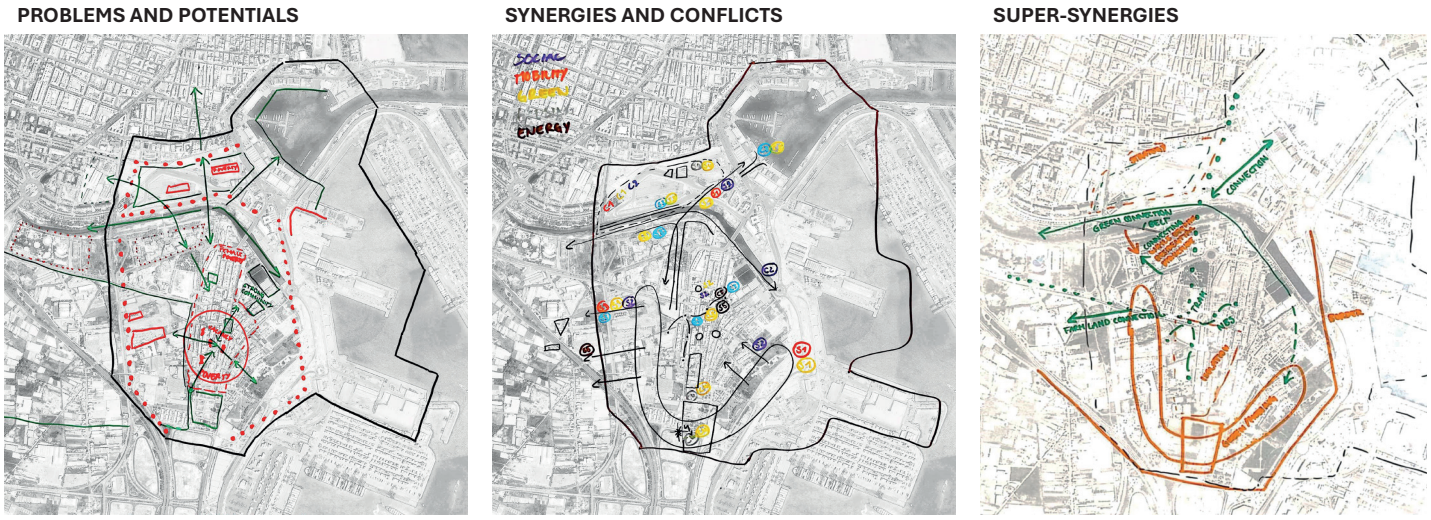


Figure 3.1.1. Preliminary maps locating existing problems, potentials, synergies, and conflicts (source Team1: Berner, Szymanski, Rameika, Schulz, Kannampallil, Zhu, 2023)

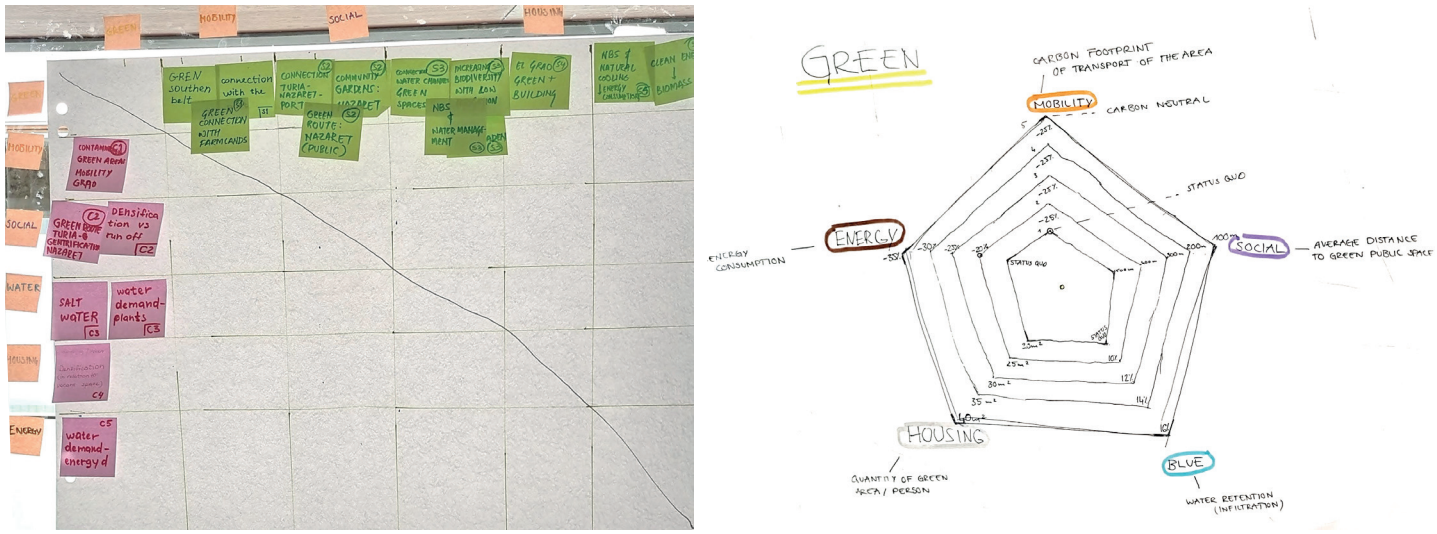


Figure 3.1.2. Matrix and spider graph to identify synergies between urban infrastructures and to propose synergy indicators (source Team1: Berner, Szymanski, Rameika, Schulz, Kannampallil, Zhu, 2023)

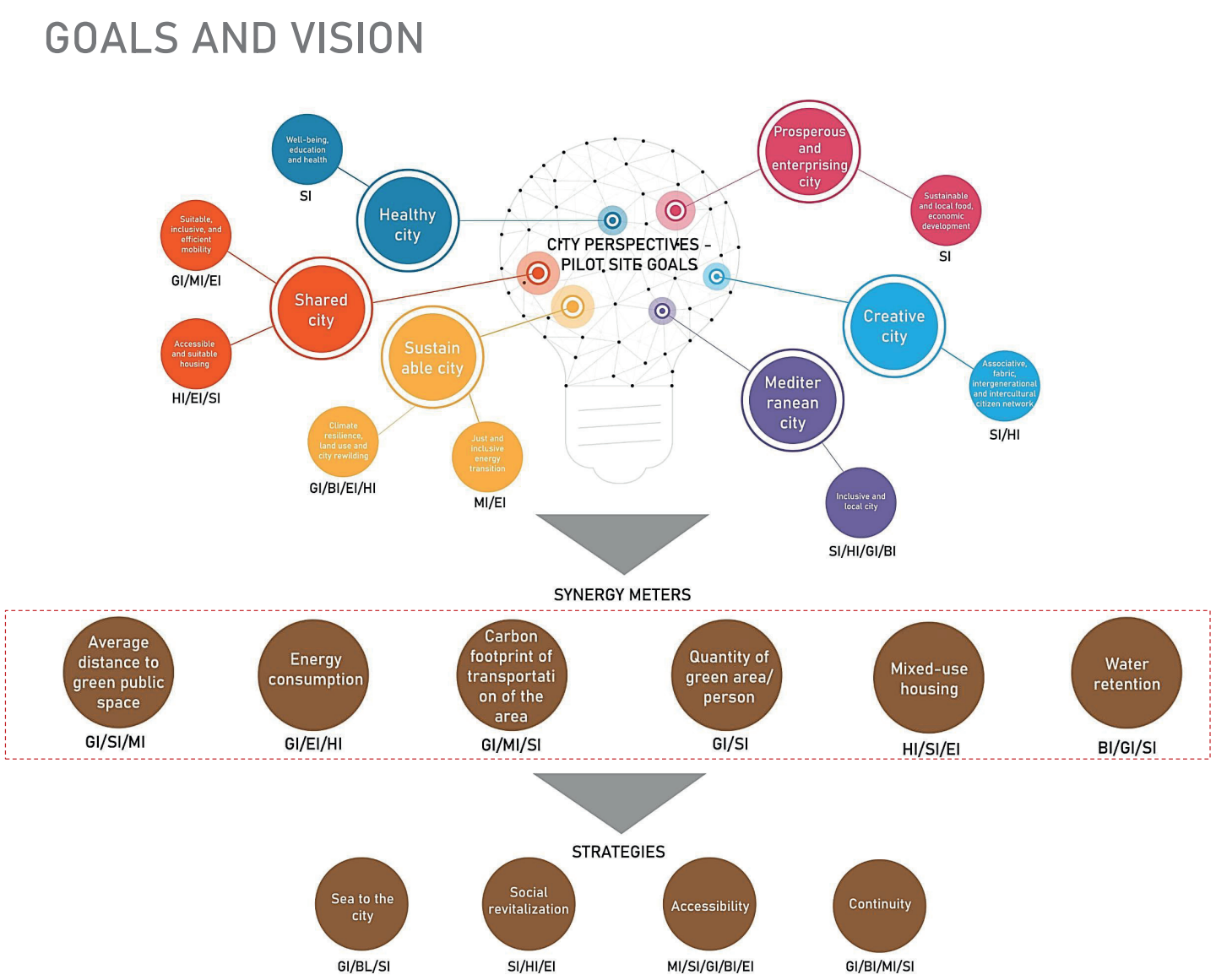


Figure 3.1.3. Definition of six key synergies and a synergy-meter as a bridge between the planning goals proposed by the team and their planning strategies for the site (source Team1: Berner, Szymanski, Rameika, Schulz, Kannampallil, Zhu, 2023)

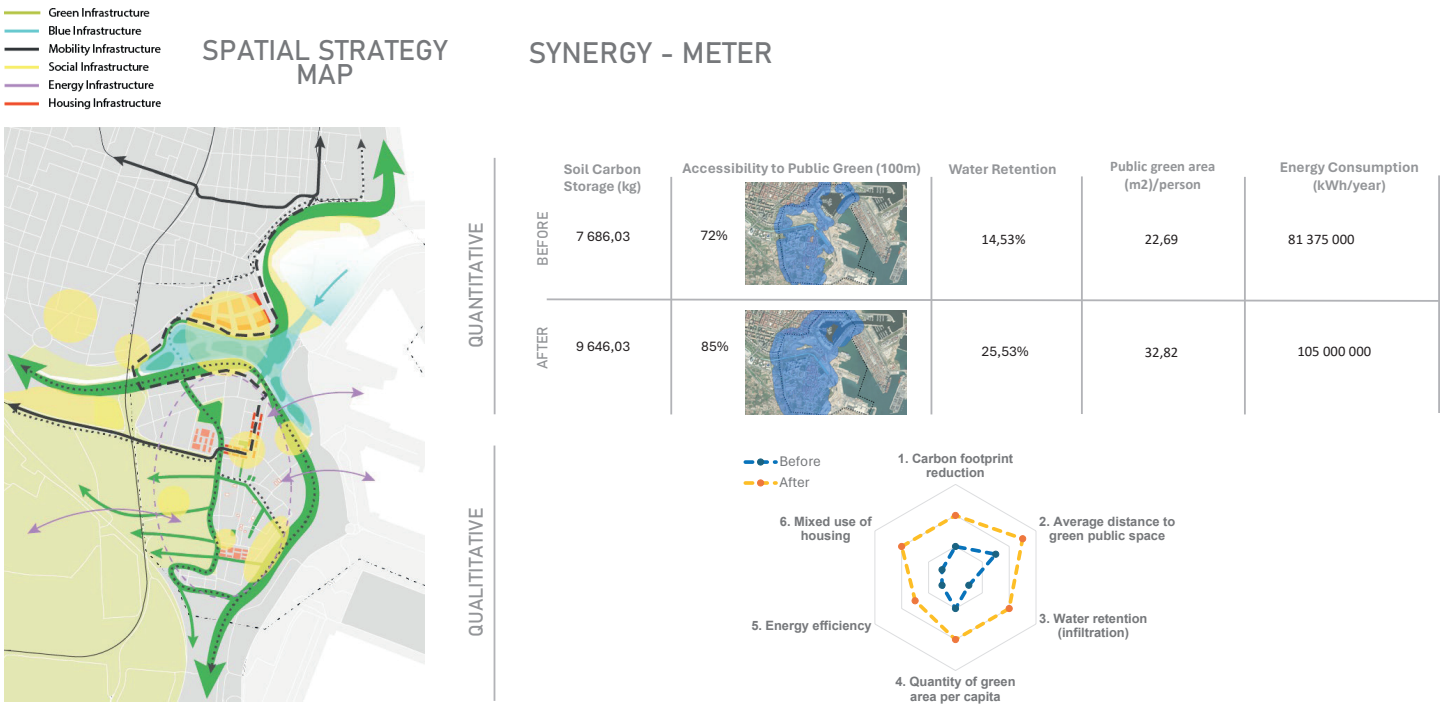


Figure 3.1.4. Use of the proposed synergy meter to assess the increase of synergies in the proposed spatial plan/strategy (source Team 1: Berner, Szymanski, Rameika, Schulz, Kannampallil, Zhu, 2023)

Team 2

Team 2 initiated the definition of their synergy tool by detecting binary or dual synergies and conflicts between the six addressed urban infrastructures with a matrix (Figure 3.1.5). The analysis of synergies was then expanded to multiple infrastructures through a network diagram (Figure 3.1.6). In order to create a more operational tool to inform the planning process, the synergies were synthetized in seven super or supra strategies (Figure 3.1.7) which were then applied to develop and evaluate a masterplan for the pilot site (Figure 3.1.8).

The collective analysis of the work developed by Team2 revealed how important the distillation of super-synergies was also for this team and how critical was for them to transform the synergies into crosscutting and operational planning strategies. Somehow, this distillation implied a certain risk of oversimplification and also revealed the difficulties in finding (or defining) in such a short time adequate indicators to measure and monitor the proposed synergies and strategies. Also in this case, the students made an productive attempt to understand the spatial dimension of the synergies (before and after their proposals).

Figure 3.1.5. Matrix displaying generic synergies and conflicts between the urban infrastructures addressed in the course (Source Team 2: Kambur, Fosshagen, Polyakov, Zannouti, & Fast, 2023)

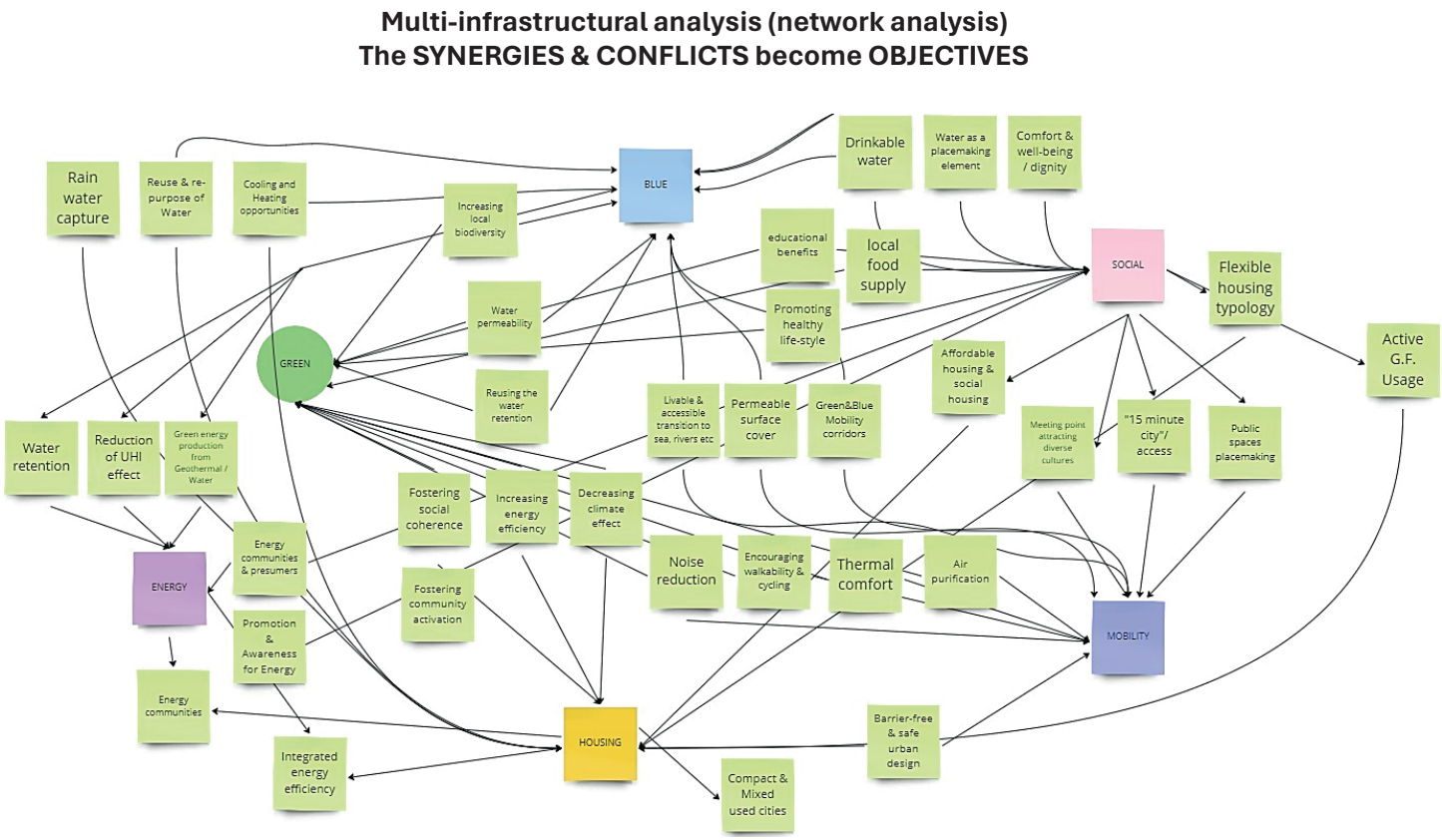


Figure 3.1.6. Network graph displaying generic synergies between the urban infrastructures addressed in the course (Source Team 2: Kambur, Fosshagen, Polyakov, Zannouti, & Fast, 2023)

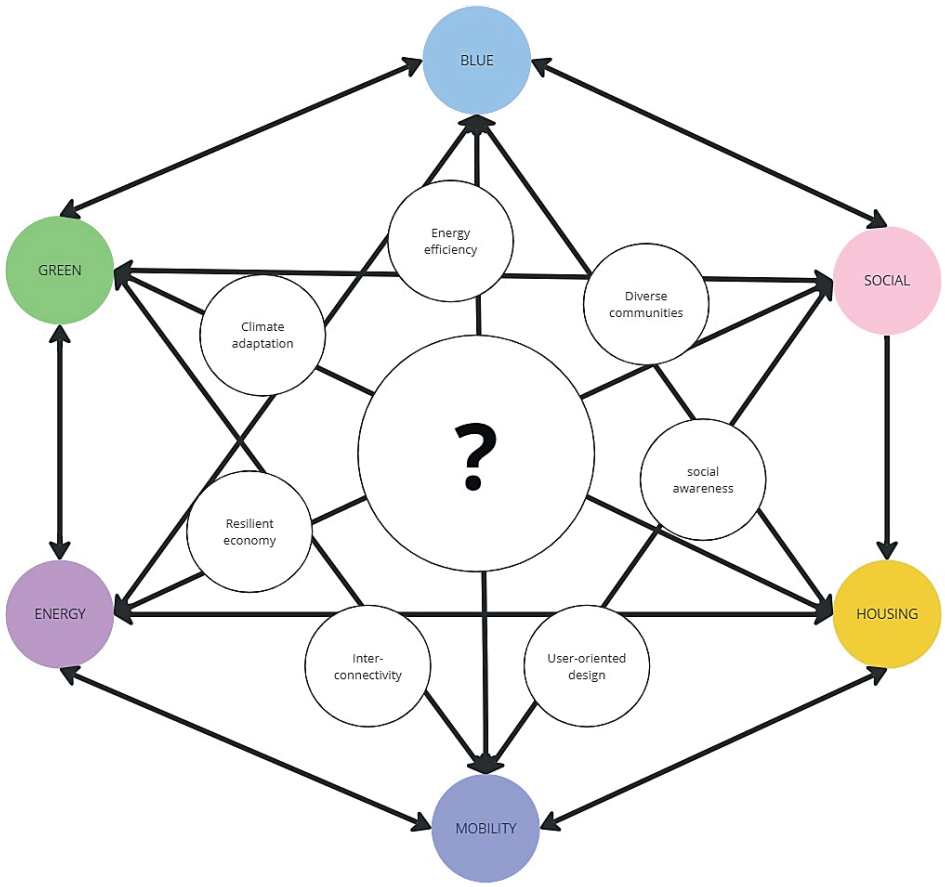


Figure 3.1.7. Definition of seven super synergies connecting all the addressed urban infrastructures (green, blue, social, housing, mobility, and energy) (Source Team 2: Kambur, Fosshagen, Polyakova, Zannouti, & Fast, 2023)

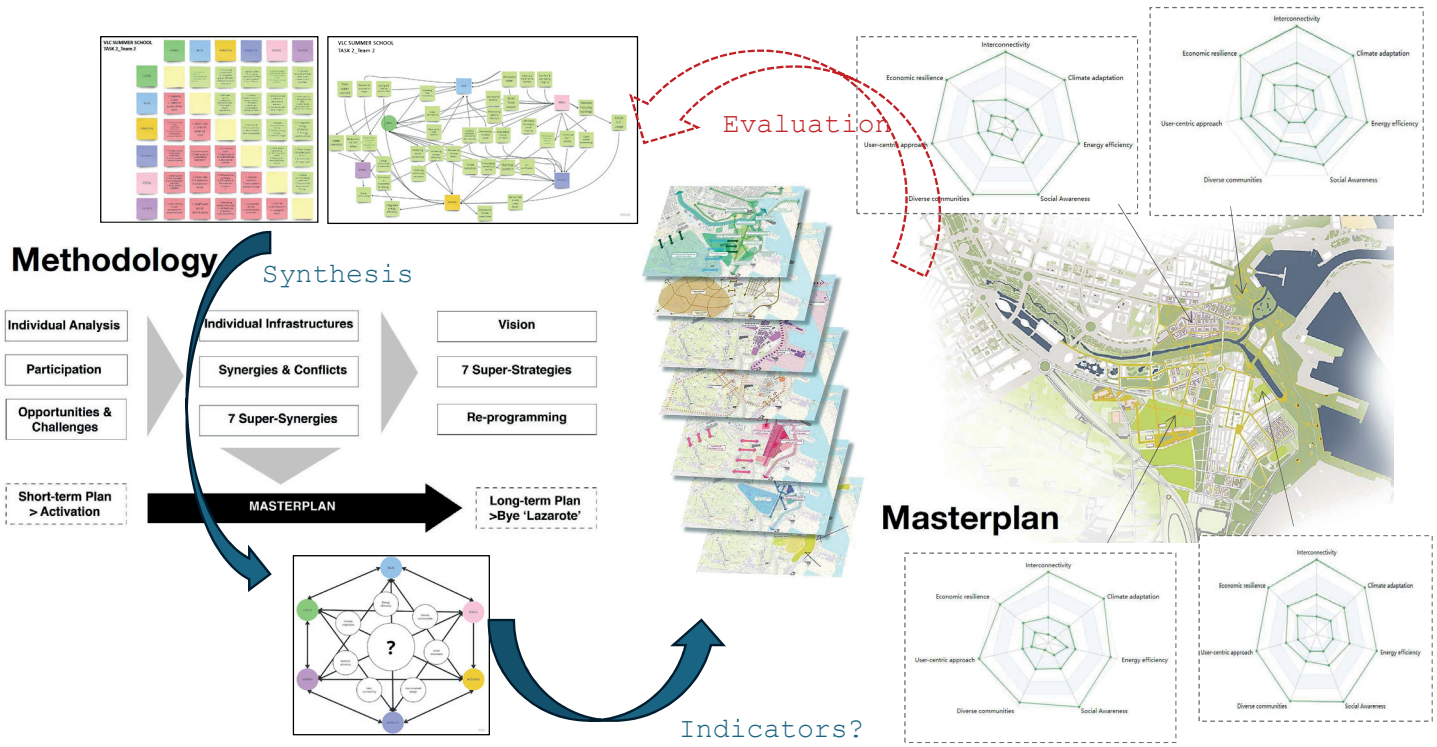
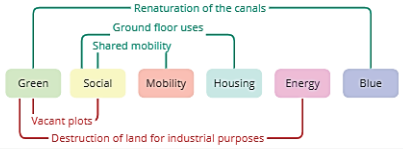
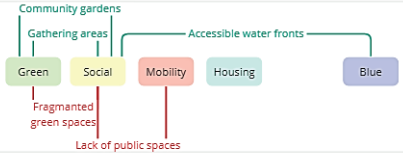


Figure 3.1.8. Diagram showing the whole process followed by Team 2 for the definition and use of a synergy-meter (source: Juanjo Galan based on the work of Team2)

Team 3

Following a goal-oriented approach, Team 3 started their work assuming the 10 goals defined in the official Strategy 2030 of Valencia and detecting with a matrix, in a different process, the main synergies and conflicts between the studied urban infrastructures. The students added an extra goal (#11) related to the reduction of Greenhouse gasses. As displayed in Figure 3.1.9, the students analyzed which infrastructures and which synergies or conflicts between them could be related with each Valencian Goal. The students worked with different pairs of infrastructures and proposed some quantitative and indicators to measure the potential synergies. In a second step, Team 3 clustered the main goals into five overarching goals which were used to advance in the development of the Spatial Strategy for the pilot site. As displayed in Figure 3.1.10 the level of achievement of these five overarching goals was evaluated using the synergy indicators by comparing the 'before' and 'after' situation.

As commented by some tutors in the post-course seminar, the work from Team3 displays a highly theoretical and methodological approach to the use of synergies in planning. This approach was based on a 'deductive' procedure in which the potential synergies were initially theorized and then were tested and identified in the pilot site. The work also reveals a strong connection with the online phase of the course in which each student of the team studied a different infrastructure and in which they got familiar with the official strategies and plans of the city of Valencia. It was particularly interesting to see how the team3 organized their work around the ten goals of the Valencia 2030 Strategy, how they assumed the Valencian Mission for Carbon. Neutrality as an additional goal, and how each team member contributed with a specific field of expertise.

Sr. No.	Valencia Goals Strategy 2030	Urban Infrastructures	Quantitative Indicators	Qualitative Indicators
1	Land-use planning and rational land use, conservation and protection		1. **Ground Floor Utilization Rate** 2. **Canal Renaturation Length**	1. social equity 2. Social inclusivity 3. cultural and recreational impacts
2	Promoting social cohesion and seeking equity		1. Length of waterfront (in km) 2. Ratio of open spaces per capita 3. No. of Gathering spaces for social activities	1. Safety and Comfort 2. Accessibility 3. Social interaction
3	Avoid urban sprawl and revitalize the existing city			
4	Promoting and fostering Urban Economy			

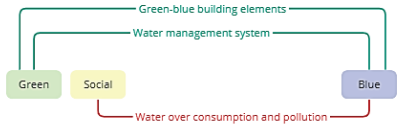
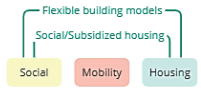
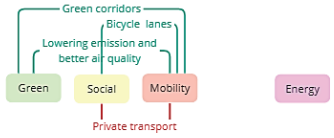
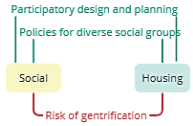
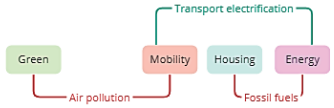
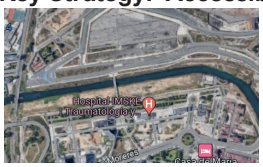
Sr. No.	Valencia Goals Strategy 2030	Urban Infrastructures	Quantitative Indicators	Qualitative Indicators
5	Preventing and reducing the effects of climate change and improving resilience		• The amount of water that is reused in litres • No. of green buildings infrastructures • Efficiency of green building infrastructures	1. **Perceptions of water quality** 2. **Resilience and flooding** 3. **health and well-being**
6	Ensuring access to housing		• How many new housing spaces are provided • Number of social housings available	1. **Affordability** 2. **living comfort**
7	Sustainable resource production/management and fostering circular economy		• Amount of energy that is produced in kW/h • The amount of water that is saved in litres	• Residents satisfaction about resources/ economy savings
8	Leading and fostering digital innovation			
9	Promoting proximity and sustainable mobility		• The amount of travel time saved by creating new communications • Percentages of green corridors • Length of bicycle lanes	• Accessibility to public transportation
10	Improving intervention tools and governance		• Level of participation • Creation of accurate policies	
11	GHGs reduction & Carbon Neutrality		1. GHG Emissions in million tonnes CO2e 2. Miles driven by vehicles 3. Fuel consumption by vehicles Litres/ KM	1. Impact on local economy 2. Perceived air quality 3. Public awareness

Figure 3.1.9. Goals of the Valencian Strategy 2030, urban infrastructures and synergies contributing to the achievement of the goals, qualitative and quantitative indicators (source Team 3: Urbaniak, Ucar, Gadkar, Dinh, Hamdache, & Anand, 2023)

Goal: Improve Social Life

Area: El Grau-Moreras

Key Strategy: Accessibility of Waterfront

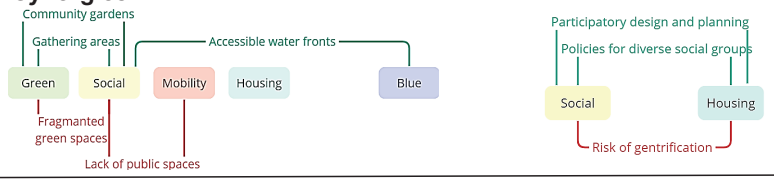


Goals: 2 10

Promoting social cohesion and seeking equity

Improving intervention tools and governance

Synergies:



Before:

Synergy:

Quantitative Indicators:

1.Length of accessible waterfront (in km)	10%
2.Ratio of open spaces per capita	3sqm
3.No. of Gathering spaces for social activities	xx for 5Ha

Qualitative Indicators:

1.Safety and Comfort
2.Accessibility
3.Social interaction

After:

Synergy Potential:

Quantitative Indicators:

1.Length of waterfront (in km)	60%
2.Ratio of open spaces per capita	10sqm
3.No. of Gathering spaces for social activities	xx for 5Ha

Qualitative Indicators:

1.Safety and Comfort
2.Accessibility
3.Social interaction

Figure 3.1.10. Synergies between indicators in one of the key strategies (Accessibility of Waterfront) proposed by the team3. Comparison of the situation 'now' and 'after' the implementation of the proposed spatial plan (source Team3: Urbaniak, Ucar, Gadkar, Dinh, Hamdache, & Anand, 2023)

Team 4

Team 4 started their enquiry by brainstorming potential synergies and conflicts between all the urban infrastructures studied in the course (see Figure 3.1.11). In the second step, this information was synthesized by defining more operational indicators for each infrastructure, identifying more evident synergies, and mapping existing synergies in the pilot site (see Figure 3.1.12). The students used this information to develop their spatial strategy or master plan, although the proposed spatial strategy was not evaluated or mapped with the proposed synergy tool.

An analysis of the work developed by team 4 reveals that the definition and use of maps during the analytical phase could be crucial to spatializing ideas and creating a bridge between conceptual diagrams and tangible proposals. This tendency was foreseeable in a course where more than 50% of the students had an architectural or planning background. In addition, it was observed that, in this case, the connection between the list of potential synergies and the final proposal was not explicitly presented. In this regard, it was agreed that the initial definition (and diagrammatic representation) of a clear method can help students to organize their work more effectively and to keep a stronger connection between the analytical and the propositive phase.

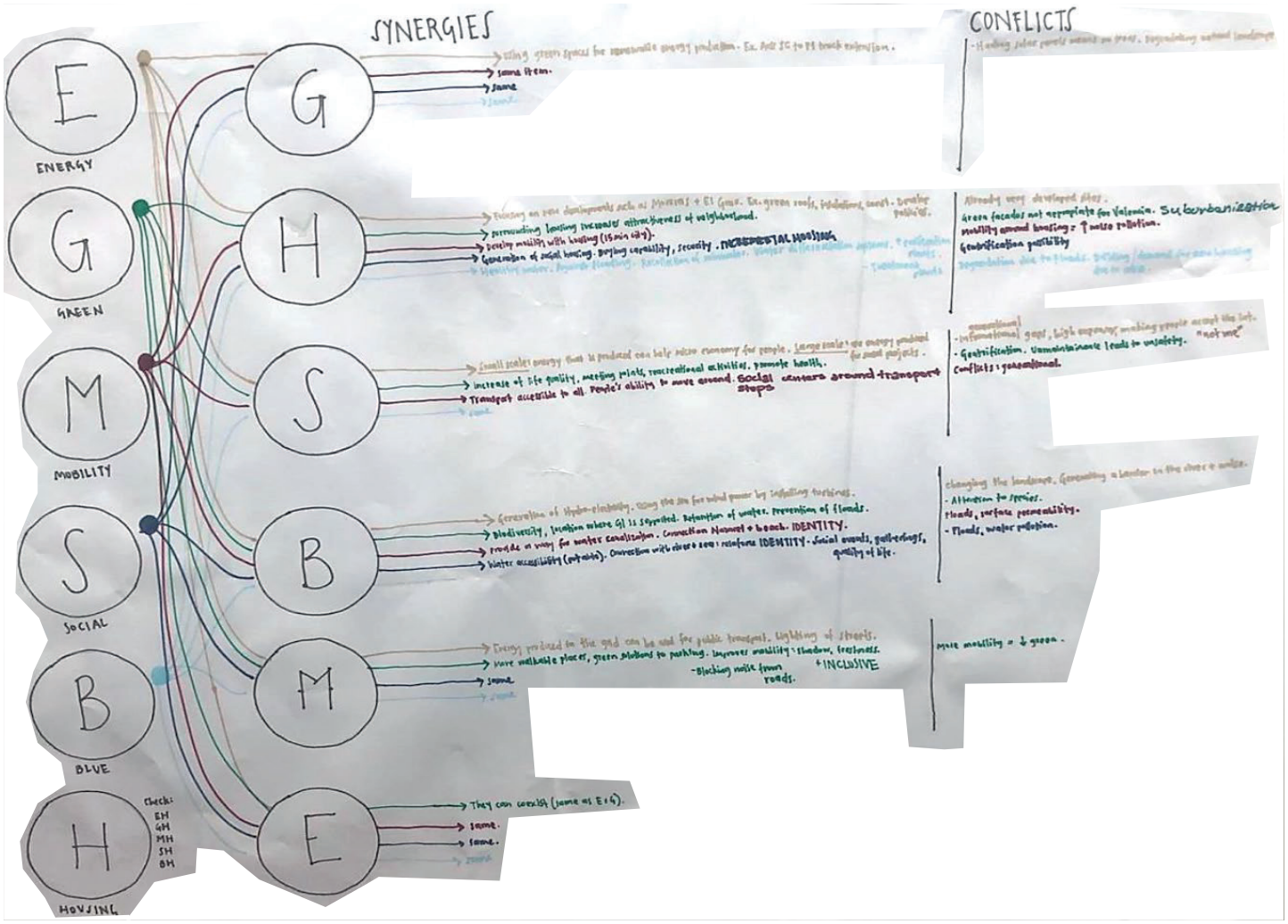


Figure 3.1.11. Synergies and Conflicts between all the infrastructures addressed in the VLC_Summer School (source Team 4: Sutkowska, Farkas, Valarezo, Cubel, & Roze, 2023)

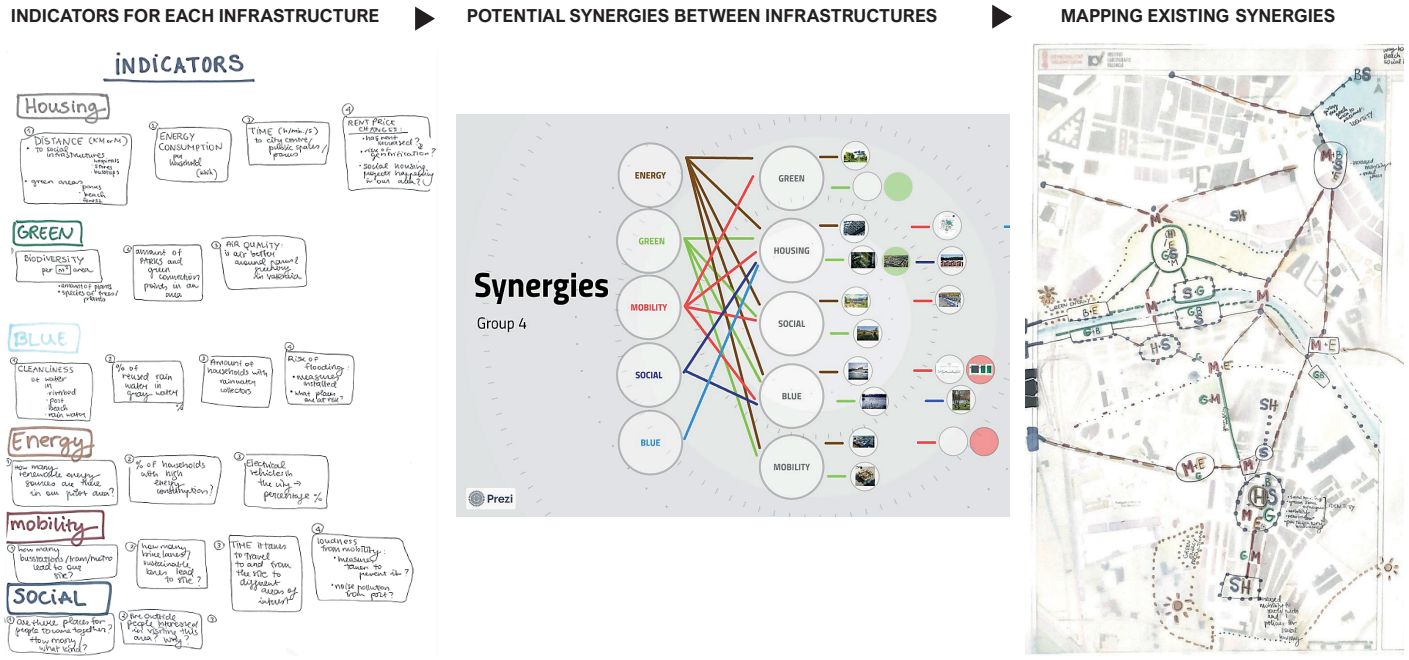


Figure 3.1.12. Indicators for each urban infrastructure, potential synergies between infrastructures and map with existing synergies in the pilot site (source Team 4: Sutkowska, Farkas, Valarezo, Cubel, & Roze, 2023)

Team 5

Following a general trend in the course, team5 moved from the identification of dual connections between pairs of infrastructures to multi-dimensional connections between all the studied infrastructures (see Figure 3.1.13). As displayed in Figure 3.1.14, in a second step, the students defined an overarching goal for the site based on social, spatial, and ecological connection and six synergy generators involving the combined use of different urban infrastructures. These synergy generators were conceived as broad actions or objectives to achieve the overarching goal. In the final step, team5 proposed a spatial strategy based on the use of synergy generators. This spatial strategy was evaluated in different subzones with a circular synergy-meter in which the short and long term of the synergies was estimated (see Figure 3.1.15).

During the post-course seminar, several tutors underlined the high level of conceptualization and abstraction in the process followed by Team5 and the importance of the visual tools that they used to explore and display connections between urban infrastructures. Despite the shortage of time, the final proposal was explicitly informed by the search of synergies and the application of the synergy generators revealed different potentials in different sectors of the pilot site. Interestingly, the initial definition of the 'synergy' concept and its utility in planning paved the way for the work to be developed by team 5. In addition, the exploration of the short- and long-term effect of synergies, added a temporal dimension to their work.

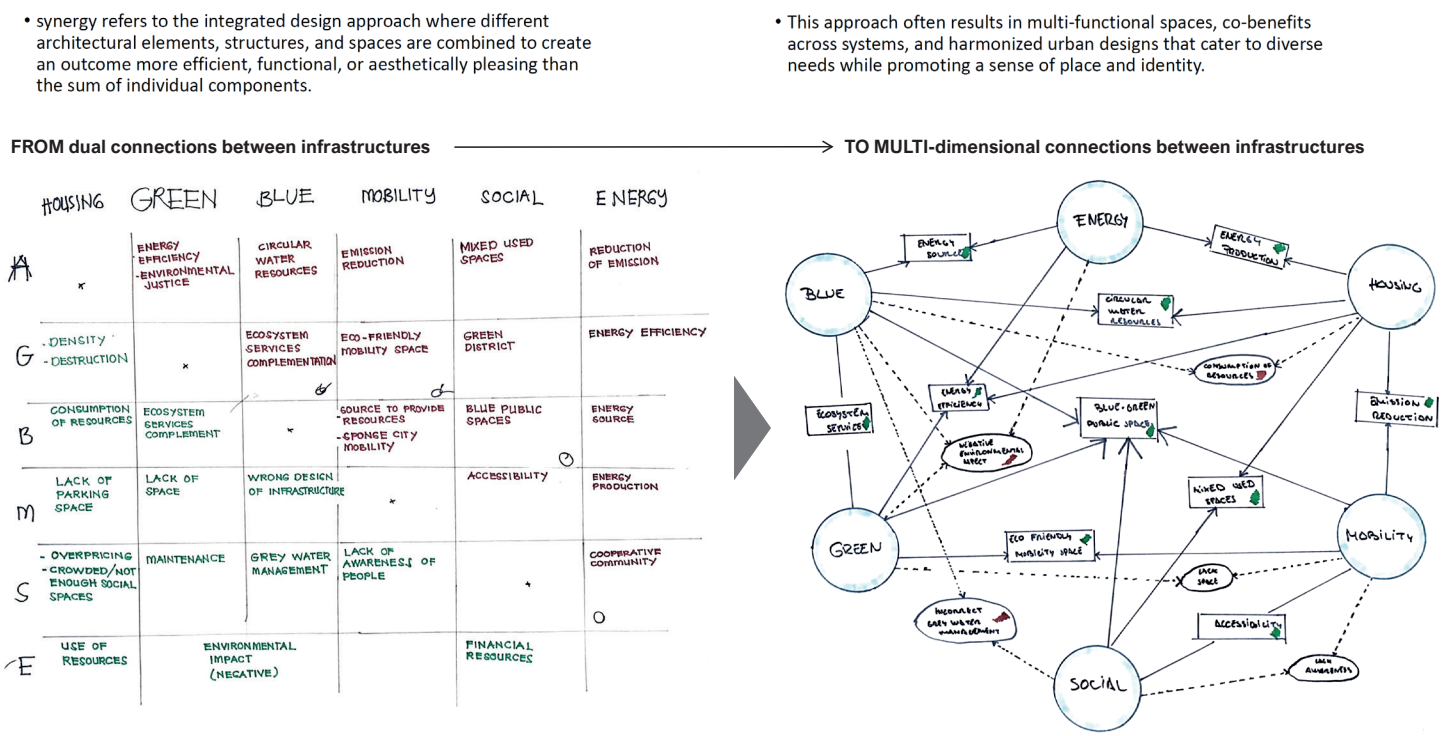


Figure 3.1.13. Defining the synergy concept and Understanding connections between urban infrastructures (source: Team 5: Archiles, Trobbiani, Gerwenat. Hoppenstedt. Posadas. & Szabra, 2023)

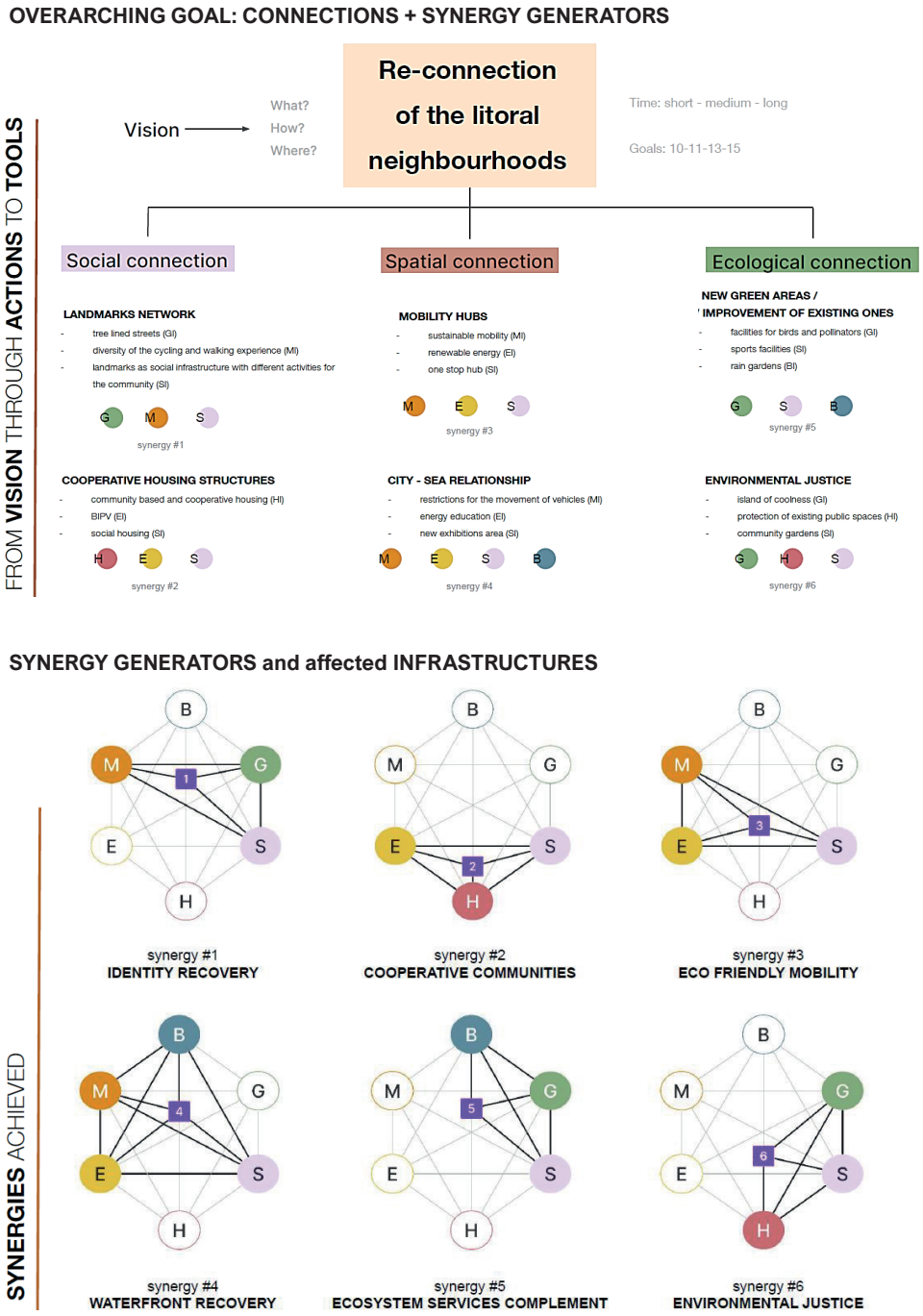


Figure 3.1.14. Overarching goal (connections) and Synergy Generators (source: Team 5: Archiles, Trobbiani, Gerwenat, Hoppenstedt. Posadas, & Szabra, 2023)

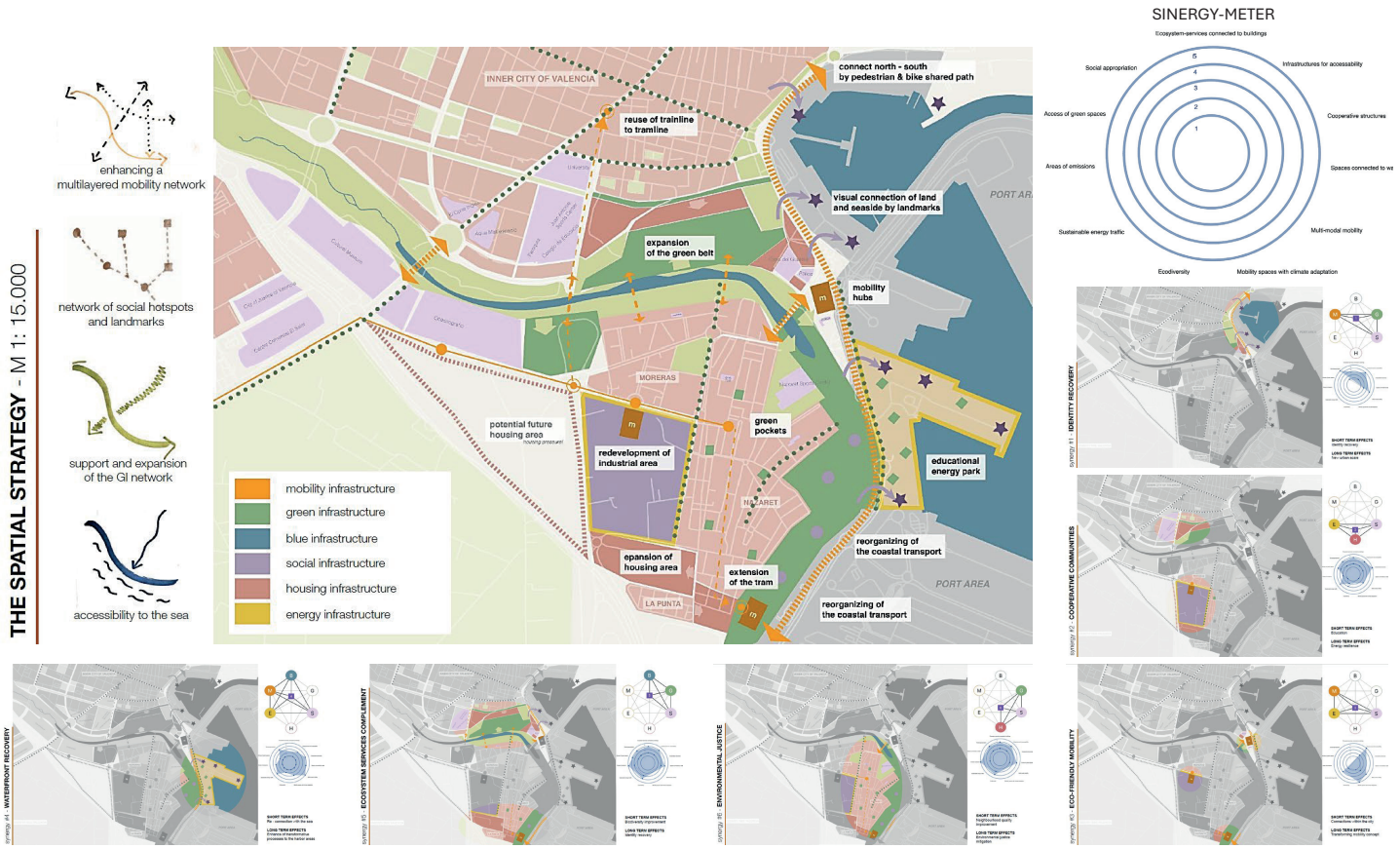


Figure 3.1.15. Spatial strategy, synergy-meter (top-right corner) and maps displaying the synergies generated through the 6 synergy-generators (small maps) (source: Team 5: Archiles, Trobbiani, Gerwenat. Hoppenstedt, Posadas, & Szabra, 2023)

Team 6

The identification by Team6 of potential synergies between different urban infrastructures was activated through the use of different network diagrams and matrices (see Figure 3.1.16). In a second step and in order to develop a more operational tool, the students decided to associate each binary connection between two infrastructures with a single concept. As displayed in Figure 3.1.17, the fifteen resulting concepts (and their indicators) were all arranged in a spider graph or synergy-meter that was later used to compare two alternative proposals for the pilot site and to design and assess the final solution (see Figure 3.1.18).

The analysis of the work developed by Team6 reveals the potential that synergy tools can have to support decision-making processes and self-evaluation. In this case, the self-evaluation potential of the tool was particularly evident since it was used by the students to analyze two alternative proposals and detect the strengths and weaknesses of each of them. In addition, the sectorization of the pilot site into coherent zones became an operative way to promote synergies adapted to the particularities of each sector.

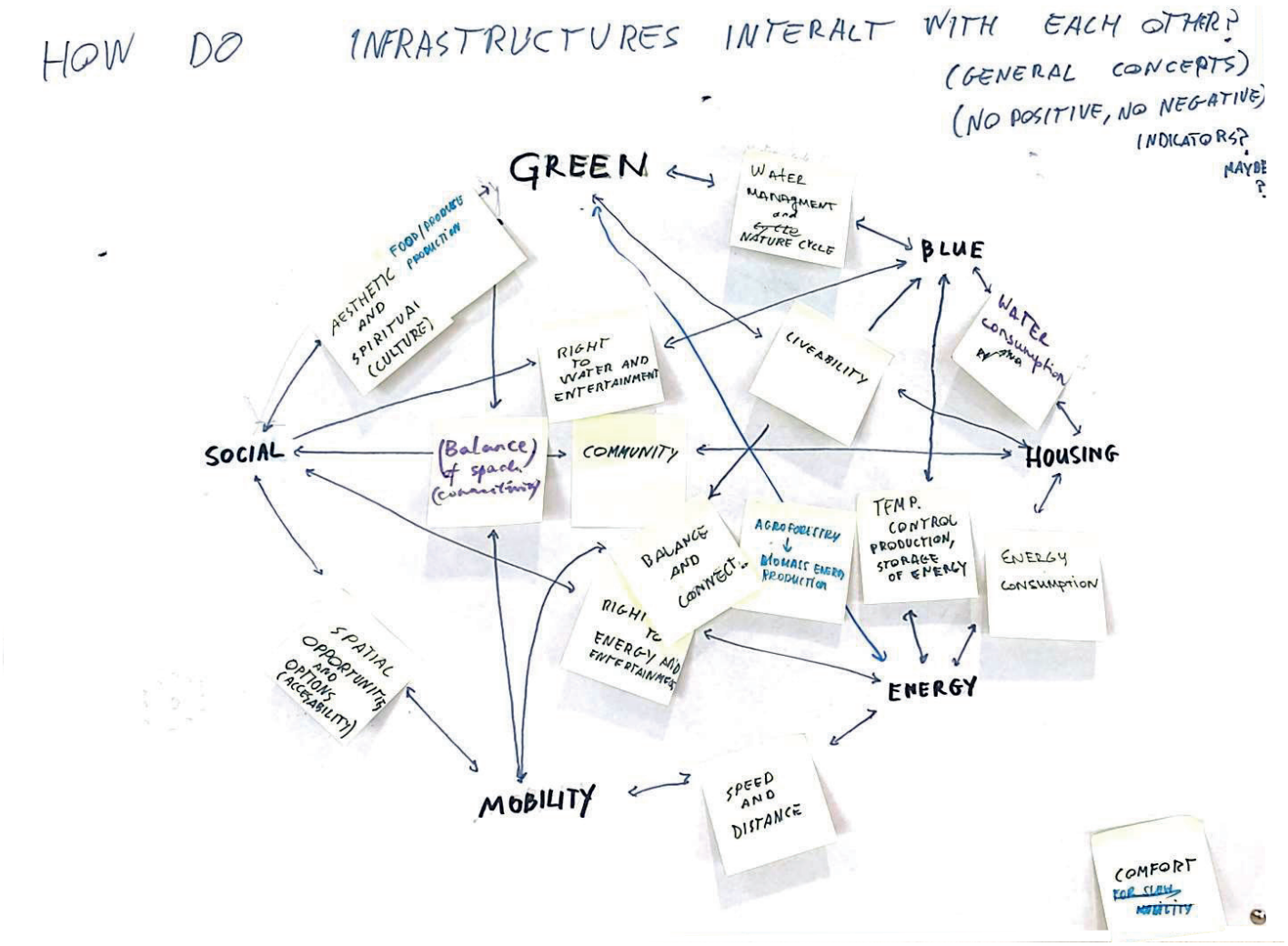


Figure 3.1.16. Initial exploration of interactions between urban infrastructures (small maps) (Source Team6: Chen, Gancarczyk, Sakhareva, Del Rio, Daulenskyte, & Movahedi, 2023)

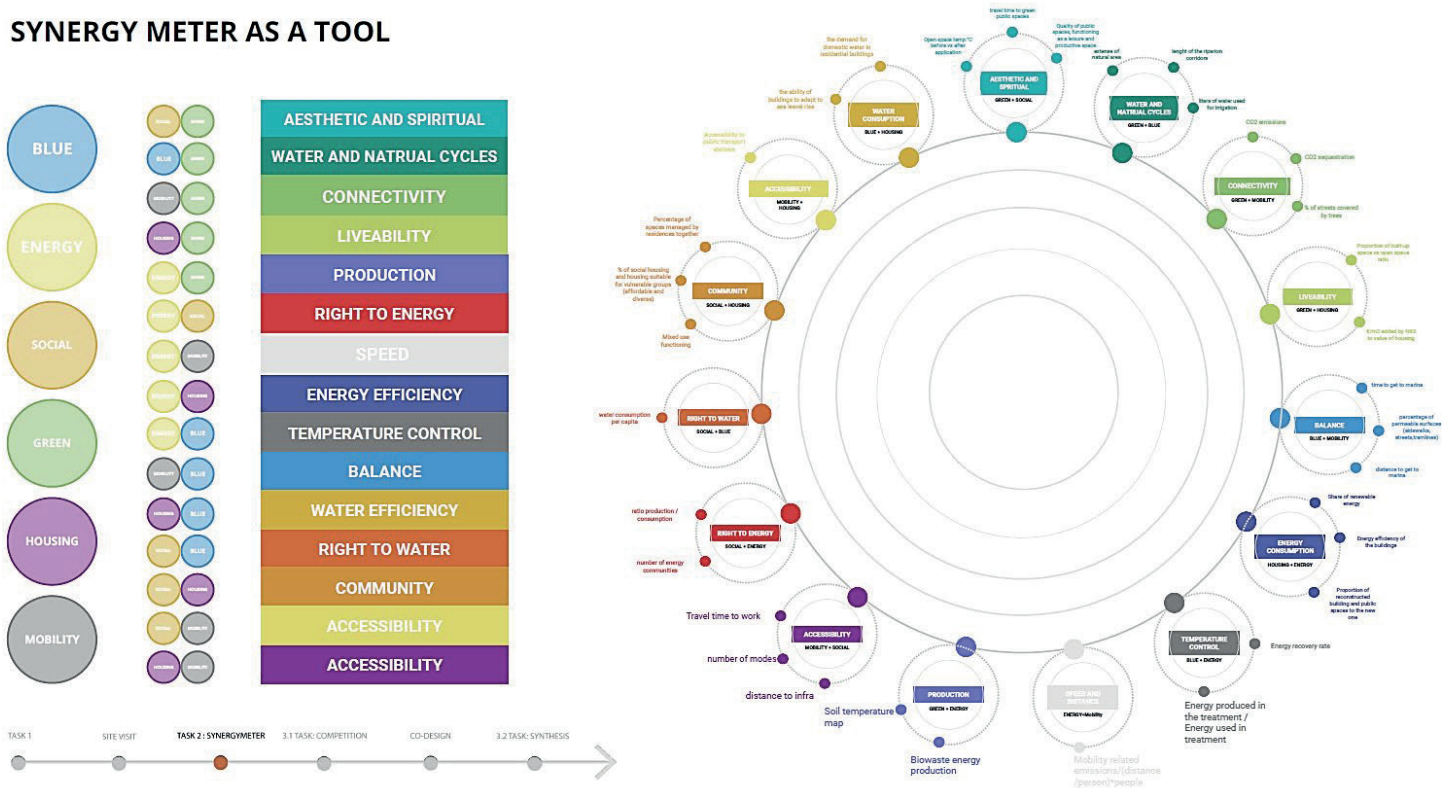


Figure 3.1.17. Concepts associated with the main synergies generated by dual/binary interactions between urban infrastructures (left) and synergy-meter comprising the above-mentioned concepts (Source Team6: Chen, Gancarczyk, Sakhareva, Del Rio, Daulenskyte, & Movahedi, 2023)

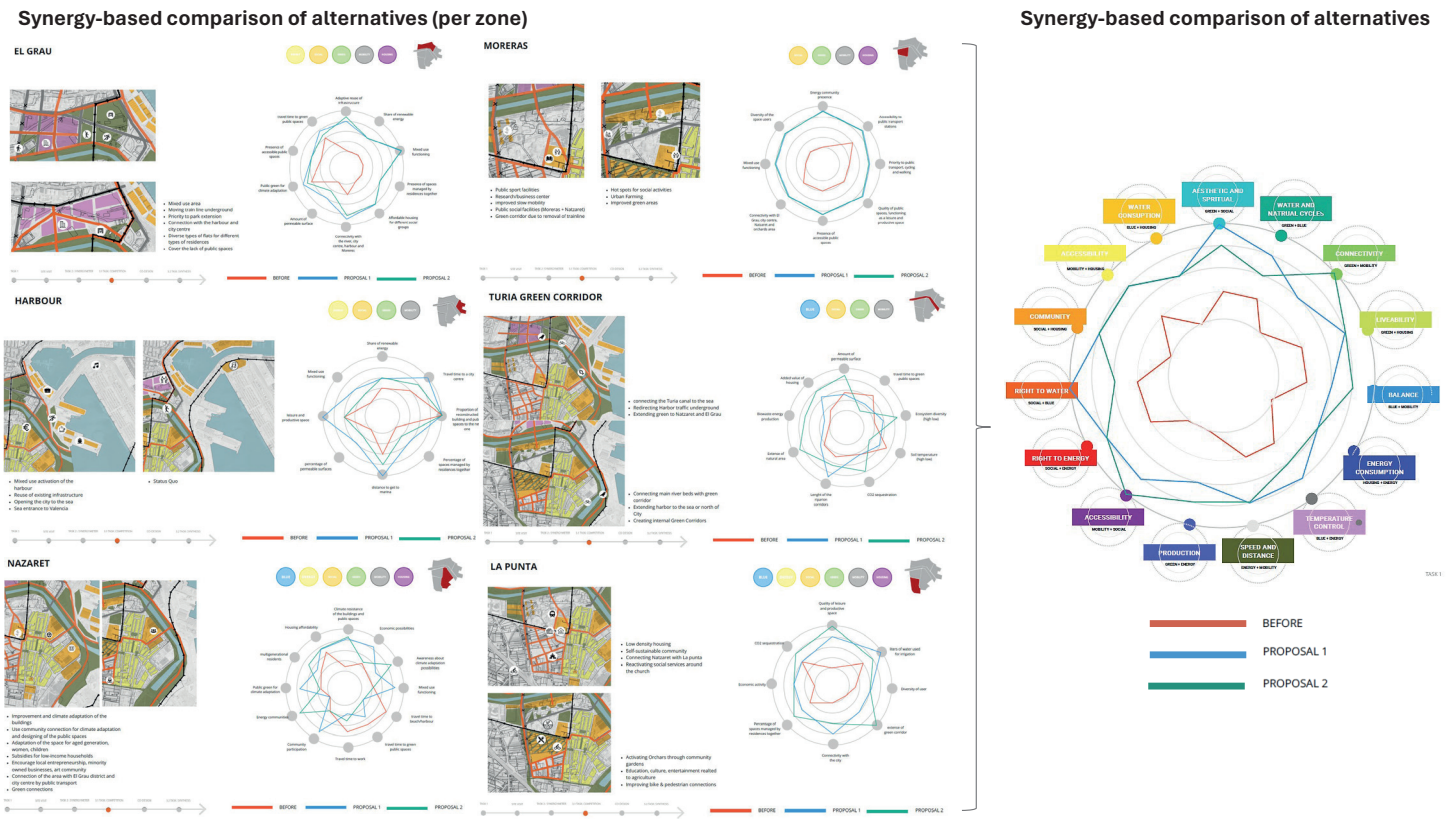


Figure 3.1.18. Use of the proposed synergy meter to compare two alternative proposals for the different areas identified in the pilot site (Source Team6: Chen, Gancarczyk, Sakhareva, Del Rio, Daulenskyte, & Movahedi, 2023)

3.1.3. Reflections

Three main topics were proposed during the post-course seminar to critically analyze the design and use of synergy tools during the VLC_Summer School:

- UTILITY: Were the proposed synergy-tools useful to support the planning process?
- CLARITY: Were the proposed synergy-tools understandable and easily connected to the planning process?
- EXPORTABILITY: Were the proposed synergy-tools and the employed methods transferable to other sites and contexts?

In addition, two additional topics or dimensions emerged during the seminar:

- METHODS: What did we learn about methods linking infrastructural synergies and planning processes?
- PROCESS: Which operational issues were critical for the development and use of synergic tools?

Utility / Usefulness of Synergic Tools in Planning

In planning, we are often searching for logical connections between analyses and proposals. By working simultaneously with different urban infrastructures (or systems), the synergic approach proposed in the course can be one of the tools helping us to reinforce that connection and support decision-making processes, systems thinking, and integrative planning. The tutors perceived this approach as an opportunity to add a new and complementary tool to conventional planning processes.

The 'synergy' concept is by definition, an 'active', 'collaborative', and 'positive' concept that, during the VLC_Summer School, activated in the students an explorative attitude. This explorative attitude was crucial to avoid the automatic generation of standard solutions and to support the search for alternative planning methods. However, this type of exercise would typically require more time to sediment and critically analyze the concepts, methods, and final outcomes.

Interestingly, the utility of the synergic approach in the proposed planning exercise derived both from its potential to become an 'assessment tool' (helping the students to evaluate the quality of their proposals from an integrative perspective) and a 'design tool' (opening new design possibilities in the interfaces between urban infrastructures).

From a cognitive point of view, the development of synergy-tools and their application in a specific case was perceived by the tutors as a positive exercise to promote relational, integrative and systems thinking. Besides, from an operational perspective, the synthesis that led to the definition of super-synergies and super-strategies, created, at the same time, some difficulties in defining crosscutting goals and indicators with the capacity to capture the internal complexity of those super-synergies adequately.

Clarity of the proposed Synergic Tools?

The clarity of the synergic tools proposed by the students in the VLC_Summer School was highly connected with the initial definition of a clear process explaining how the synergies between infrastructure could be analyzed and introduced in the elaboration of proposals.

From a practical perspective, the early use of diagrams explaining the workflow and the joint definition of key concepts or terms within each team became crucial to create a common understanding of the task, to support the planning process, and to effectively conduct the work.

In particular, graphic tools were essential to synthesize ideas, to explore connections, and to develop and assess proposals. There was a clear correlation between the clarity of schemes and diagrams and the capacity of the students to define a solid planning process based on the goals of the course.

As indicated above, the generation of super-synergies and cross-cutting strategies were a necessary step to simplify and operationalize the work and to define a clearer narrative. However, some of the newly proposed concepts were so wide that it became difficult for the students to link them with manageable indicators. This is a frequent challenge when working with highly crosscutting concepts such as sustainability or resilience and its resolution usually requires finding a compromise between diffuse integration and specialized sectorization.

Exportability of the proposed Synergic Tools?

During the online phase of the course, the thematic teams were invited to propose generic toolboxes to improve their respective infrastructures in any urban location (green, blue, social, housing, mobility, and energy). This created a decontextualized approach that was also followed by many teams in the elaboration of Task2 during the onsite phase. As a result of this approach, most of the synergy-tools and synergy-meters proposed in the course were quite generic and transferable to any context. However, as the students advanced in the definition of synergy tools, it became evident that it was necessary to understand the spatial dimension of the synergies and, therefore, to concretize the synergy tool in the specific context provided by the pilot site. As presented in section 3.2, some teams decided to link their synergy-tool to the specificities of the site, whereas others decided to stay more general. As a consequence of this, exportability was logically higher in those works that started with a theoretical and deductive approach, or in other words, in those works that defined a generic synergic tool that was then tested and applied in the pilot area.

Methodological reflections

Due to the short duration of the course, the definition of synergic tools was mainly conducted following a linear path or process. However, in a longer course, it would be advisable to keep more time for iterations and for the progressive adjustment of both the synergic tools and the final outcomes. Nevertheless, some teams were able to include some iterations in their work, for instance, by readjusting their goals or by improving their synergy-tools after developing their preliminary proposals for the pilot site or after meeting local actors.

Although each team was able to develop their own synergic tool and their way of using it, it is important to notice that the overarching method was the same in all six teams:

(1) Preliminary brainstorming sessions to identify potential or existing synergies and conflicts between urban infrastructures or systems.
(2) Synthesis and operationalization of synergies through synergy meters, synergic strategies, and linkage to urban goals
(3) Application in planning and validation/ adjustment of the synergy tool

Despite this overarching framework, it was noticed that some teams followed a more inductive method (detecting and conceptualizing synergies by observing how infrastructures interact in the city of Valencia and the pilot site), while many others tended to follow a deductive method (predicting synergies through a theoretical model and confirming in a later stage if these synergies were taking place).

As indicated before, there were several aspects and issues that were relevant to the methodological definition of the synergy-tools. Firstly, the identification of qualitative or quantitative indicators was often perceived as a necessary step to assess synergies and to understand their meanings fully . Secondly, the level of connection of the proposed synergy-tools to the specific conditions of the site affected their universal or contextualized character. Thirdly, the innovative and effective use of graphic tools to represent and explore connections between infrastructures (matrices, network graphs, etc.) and the synergies generated in the proposed solutions (spider graphs, tables with scores for different indicators, etc.) had a clear influence in the capacity of the students to define a solid narrative and an effective work process. Fourthly, the definition of maps was essential to spatialize the location of existing or proposed synergies and to understand more clearly their meaning. Fifthly, the definition of super-synergies opened an effective way to simplify and operationalize the work, but it also required the definition of new and more complex indicators.

The initial brainstorming sessions were an excellent way to activate discussions in a very short time, to reveal different or complementary points of view, to bring to the table different types of knowledge and sensitivities accumulated during the online phase, and to start visualizing within each team the scope of the final task. Conversely, the synthetic sessions that followed were essential to make the task more manageable and were often based on the clustering of ideas or the definition of overarching concepts.

Overall, the synergic approach to planning is a highly data-demanding process. Due to the limited conditions of the course, it was decided to keep, in many cases and for many indicators, the analysis at a qualitative level. However, with more time, resources, and data, it would be possible to operate in a more quantitative way and generate digital models that measure synergies between different urban infrastructures in different scenarios or alternatives more accurately.

To close these methodological reflections, it must be noted that the use of the synergic tool to assess the strengths and weaknesses of different alternatives or the final proposals was found particularly instructive for the students. In addition, it was also interesting to notice that the sectorization by some teams of the pilot site into more homogeneous functional areas proved to be a good way to adjust the application of synergic solutions to the specific programmatic and spatial conditions envisioned for each of these areas.

The Process: additional reflections about the development of task2

Most of the procedural aspects have been commented on above, so this section will focus on some additional and practical reflections. Considering the limited time, all the produced outputs exceeded the initial expectations from the tutors, and all teams achieved the planned learning goals. However, more time would have been needed to reflect and sediment all the developed ideas. At the same time, results reveal how each team decided to put more emphasis on different parts of the task and how this influenced the rigor or quality of the methodological component or the final outcomes. In this regard, the background or personal skills of the students influenced their approach to the task since some of them were more used to get engaged in conceptual, strategic, and planning activities, while others were more design-oriented .

In general, the process was quite transparent, and the linkages between the initial ideas and the final results were evident. However, more steps would have been needed to reinforce those connections (e.g. linkages between preliminary analyses and generation of specific proposals).

The scale and complexity of the pilot site were adequate for the proposed exercise, but it exceeded the usual size for students who did not have much experience in city and urban planning. One issue that was also discussed during the post-course seminar was if the involvement of each student during the online phase in a different type of infrastructure helped them to complement each other and to provide complementary insights in the identification of synergies and conflicts. In this regard, it was detected that the majority of the students really ‘played’ their role of experts in one infrastructure within their teams.

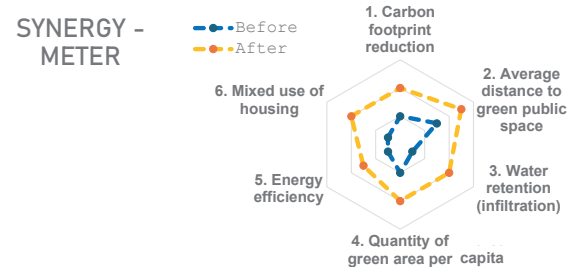
One of the crucial activities during the onsite phase of the VLC_Summer School was the participatory meetings with local people and experts. These meetings were essential to add a human dimension to the course, and from the perspective of task 2, they allowed the students to check if their synergy tools were detecting and addressing all the critical aspects. Similarly, the role of the tutors was crucial to keep a certain level of unity in the course, but at the same time, to take care of what made the work of each team unique and to bring their personal knowledge and sensitivity to the work of the teams that they were tutoring. Somehow the work developed by each team reflects the specific and unique characteristics of their students and tutors.

TEAM 1

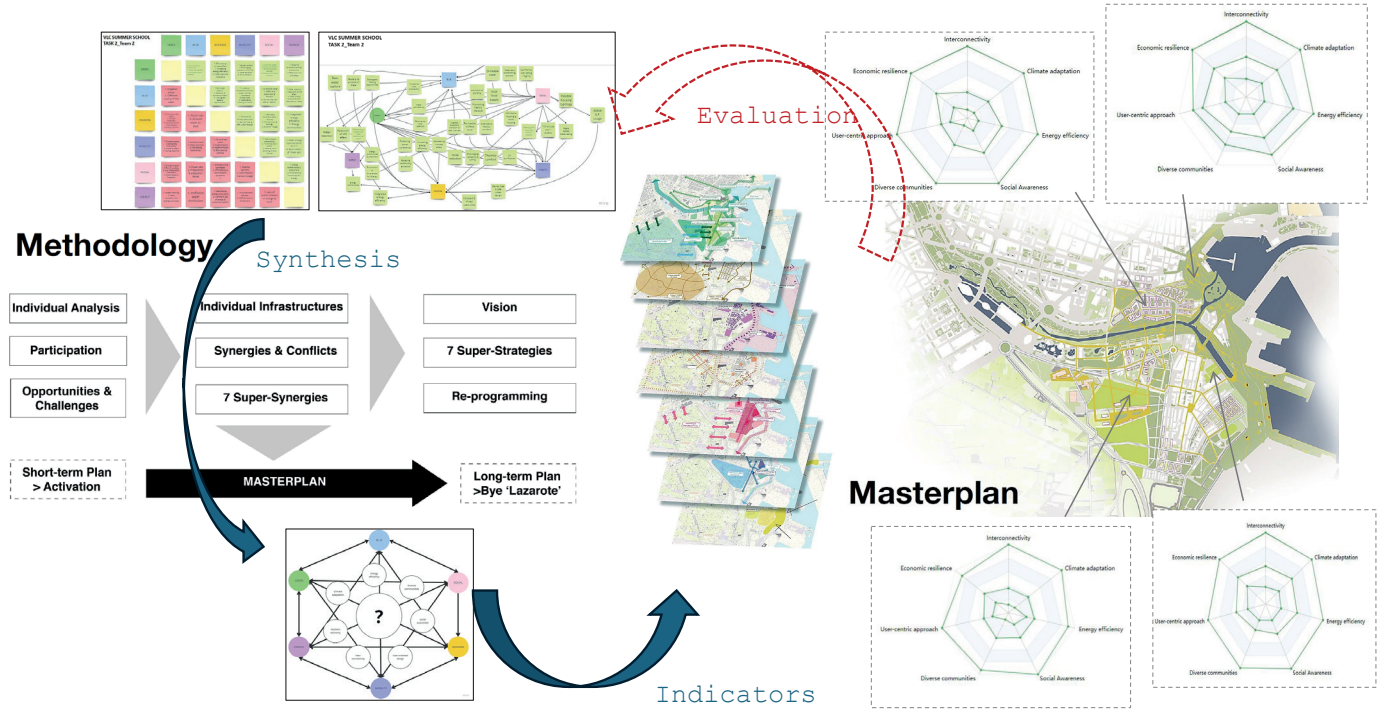
QUANTITATIVE

	Soil Carbon Storage (kg)	Accessibility to Public Green (	Water Retention	Public green area (m2)/person	Energy Consumption (kWh/year)
BEFORE	7 686,03	72%	14,53%	22,69	81 375 000
AFTER	9 646,03	85%	25,53%	32,82	105 000 000

QUALITITATIVE

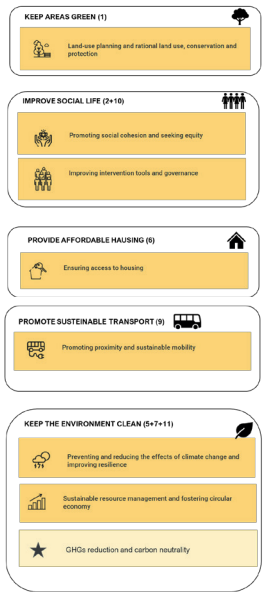


TEAM 2

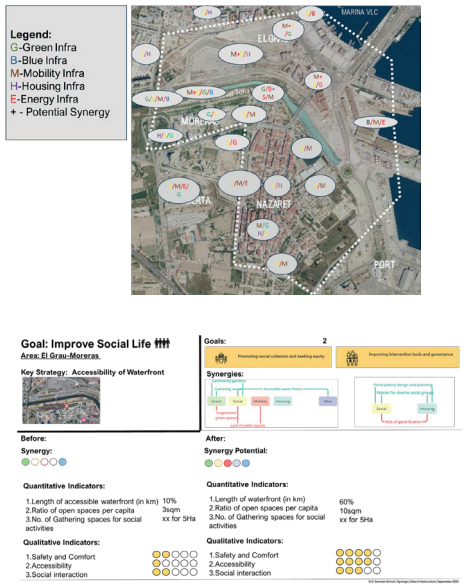


TEAM 3

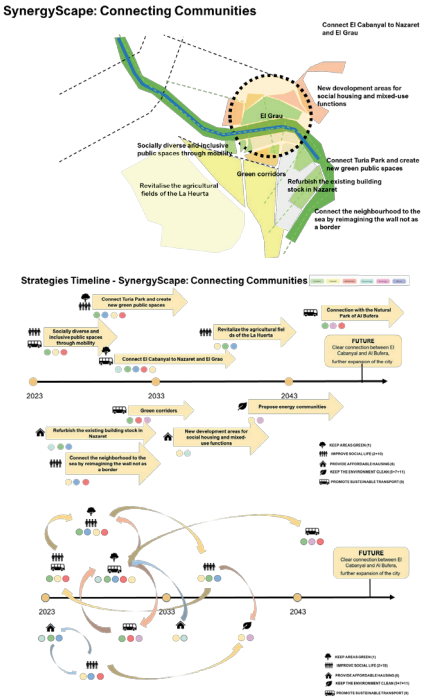
5_Simplification of Valencia Strategy 2030 – Goals



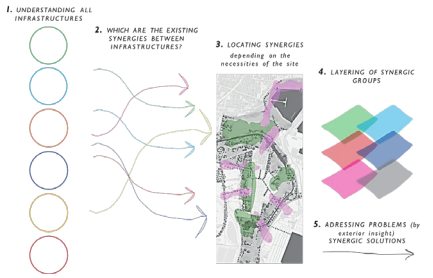
6_Existing synergies and Synergy Potentials

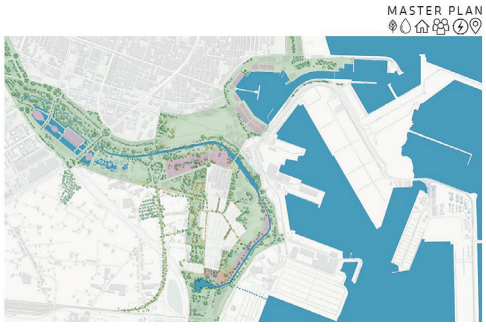


7_Proposal: 10 crosscutting strategies, visions, and timelines



TEAM 4





- **FOCUS ON GREEN SYSTEM**
- **SYNERGIES**

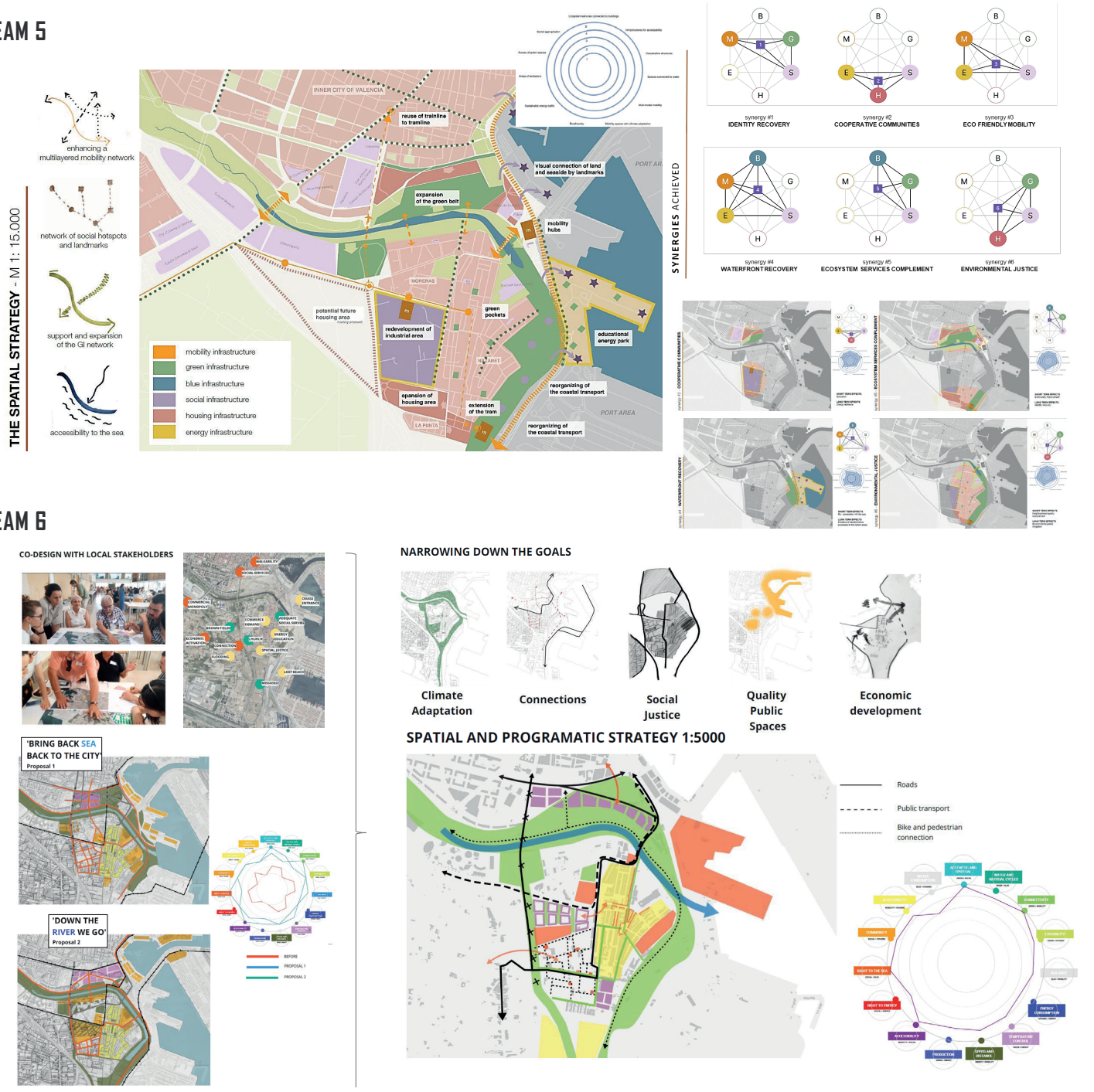


Figure 3.1.19. Collage of the synergy tools defined by each team of the VLC_Summer School and of their application in the pilot site (source: Juanjo Galan, 2024 based on the works prepared by the teams during the on-site phase)

VIDEO displaying a summary of the seminar organized by the teachers of the VLC Summer School in February 2024 to analyze and discuss the methods that were designed and applied by the students during the course .

Film editor: Martina Schretzenmayr, ETH Zurich

http://tiny.cc/2046_Video