

# A collaborative dashboard to study periurban densification

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Suburban densification is an opportunity for more sustainable cities while avoiding many negative externalities linked to centre densification, such as scarcity of space, price increase, or housing shortage (Jehling et al., 2020). However, considerable planning challenges are met when confronting the multiple rationalities of involved stakeholders. The SubDense European project aims in that context at better understanding the polyrationalities of space, actors and policies on suburban densification, by exploring how diverse strategies of land policy interact with landowners' and local stakeholders' interest and agency to shape suburban densification and their impact on suburbia across different planning systems (France, Germany, UK). The project combines quantitative approaches (geodata analysis and geosimulation) with qualitative approaches (social and policy science and planning).

When working on such diverse case studies at a large scale, many issues arise, such as how to share analysis and methods for reproduction on other case studies, or how to integrate knowledge on data specification which changes can strongly bias the densification analysis. There is also a need for sharing tools and methods for building change detection, such as polygon matching algorithms. We propose to tackle these difficulties by constructing a collaborative dashboard, which will act as a medium to facilitate collaboration between project partners, will enable the sharing of methods, data and metadata (Bucher et al, 2020), and will allow reproducibility.

We use a git-based architecture for the core dashboard to ensure tractability, full history, reproducibility, flexibility, and collaboration through branching and a shared remote repository (<https://github.com/subdense>). Clients will implement interactions with the core and functionalities needed by partners for data analysis and integration (running change detection algorithms, adding data, exploring results and maps). An iterative process to produce user stories is currently implemented, to finally lead to final specifications for the core architecture and functionalities of clients. A first version of the dashboard has already been deployed, through which partners have shared first densification analysis and data expertises.

Future developments and analysis to be integrated through the dashboard will include heterogeneous data integration (Bucher et al., 2021), to couple densification analysis with socio-economic data, and the development and exploration of simulation models for the impact of policies on densification processes. These models will act as bridges between quantitative analysis and the qualitative data obtained through interviews during the project.

## References

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