

# Impact of Urban Structures and Planning Activities on Mobility

This research is driven on the determination of the context-based urban dependencies for mobility demand. The performed analysis is indicating simulated data-driven household mobility consumption study and assessing human settlement typologies within Swiss municipalities. Examination this impact of spatial planning combined with mobility behavior requires decision-making guidelines for regulations

and measures possible urban settlements policy and mobility concepts, which are developed to support the process of change within municipalities and external stakeholders in collaboration with external stakeholders. The data basis for the cluster analysis is the output of scenarios of optimal mobility and renewable energy infrastructure within an urban settlement result.

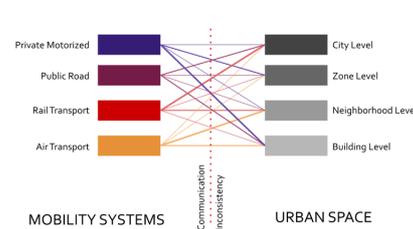
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## Introduction

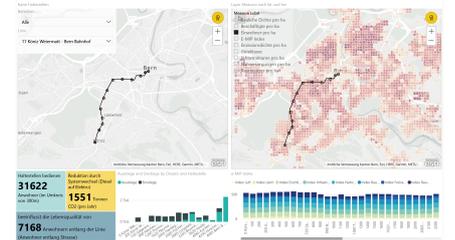
By 2035 Switzerland is expecting 10 Million habitats [1] and approximately 70 per cent of that population will live in cities. Estimate the amount of consuming energy by mobility, correlated to each urban object – and show the dependency of the life-quality. Create a new assumption on data-driven generative modal split the main research aim concentrated on the correlation of urban development and how the mobility is distributed. Data aggregation methods are combining a network visualization research relevance with urban human habitats behaviour, which is influenced by population density and mobility. Showing the optimal density ration for lowering GHG emissions, the results demonstrate the importance of understanding urban behaviour supported by research steps as processing, interpretation, simulation and visualization of data.

## Research Objectives



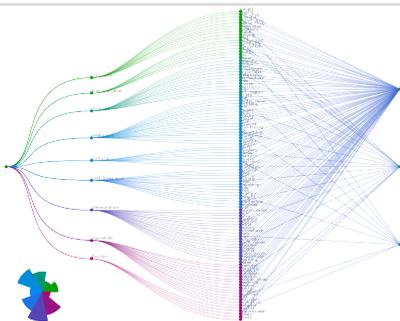
The lack of coordination between mobility and urban planning allowing research on new data-driven planning possibilities. Achieving change of the status quo of the next generation of corresponding decision-makers with the integrated holistic thinking about those two systems and develops methods to process computational mobility-demand models in this context.

## Research Objectives



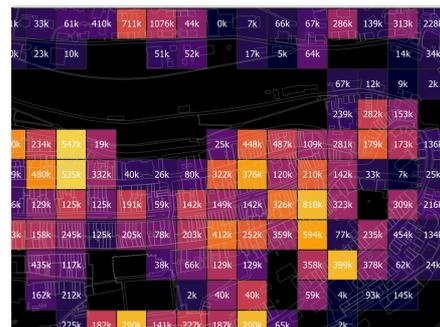
Towards the decision tool opens one of the challenges responsible for, to build a framework for changing a mindset, where the goal is a coherent spatial evaluation of density indicators as population, public transport or service supply [2] influencing the quality of life. Optimized their urban behaviour with special consideration of CO2 neutrality.

## Data Aggregation Methods



The structure of service supply density is consolidated by data aggregation of retrieved Points of Interest [3], service supply network [4] and employment data sets [5] in interest groups by behaviour.

## Functional Mapping



Data visualization of density indicators of mobility demand introduced as an interactive grid on the example of the city of Bern. The mobility needs of all households are summed up over all modalities.

## Expected Impact

The current result is the extension of the perspective beyond the pure mobile planning question of the line guidance to a contextual urban assessment of the quality of life is considered. The modal split shifts away from motorized transport to public transport and pedestrian traffic with a higher population density. Possibilities of data generation and the consolidation happening through into the service supply network. The figures show the demand for the corresponding quarter-hectare. From this characteristic, a planning added value is to be generated expected impact is a detailed impact of a modal split of the performed research project on energy demand and GHG emissions, with conditions of the project contribute to lowering mobility induced energy demand and allowing government and educational institutions use the developed process.

## References

- [1] Population, BFS, [www.bfs.admin.ch/bfs/en/home/statistics/population.html](http://www.bfs.admin.ch/bfs/en/home/statistics/population.html), requested 2019
- [2] Bubenhofer J., et. al., Dichte und Mobilitätsverhalten, Bundesamt für Raumentwicklung (ARE), [www.are.admin.ch/are/en/home/media-and-publications/publications/fundamentals/dichte-und-mobilitaetsverhalten](http://www.are.admin.ch/are/en/home/media-and-publications/publications/fundamentals/dichte-und-mobilitaetsverhalten), requested 2019
- [3] Points of interest, OpenStreetMap, [https://wiki.openstreetmap.org/wiki/Points\\_of\\_interest](https://wiki.openstreetmap.org/wiki/Points_of_interest), requested 2019
- [4] Beschäftigte (in Vollzeitäquivalenten) im Detailhandel, [www.bfs.admin.ch/bfs/de/home/statistiken/kataloge-datenbank-en/karten.assetdetail.1864423](http://www.bfs.admin.ch/bfs/de/home/statistiken/kataloge-datenbank-en/karten.assetdetail.1864423), requested 2019
- [5] Job statistics, [www.bfs.admin.ch/bfs/en/home/statistics/industry-services/businesses-employment/jobs-statistics](http://www.bfs.admin.ch/bfs/en/home/statistics/industry-services/businesses-employment/jobs-statistics), requested 2019

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