



XXVII FIG CONGRESS

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Creation of spatial plans package for the representations of RRRs caused by spatial plans within the LADM standard: A case study for Turkey

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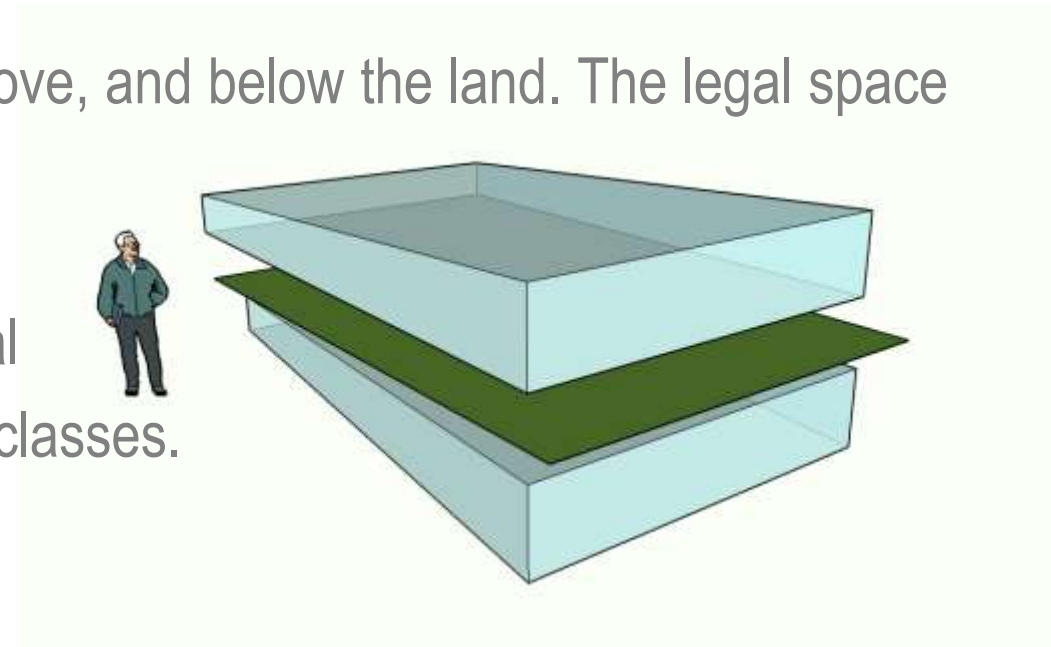
Introduction

- In order to ensure the effective, efficient, and fair use of lands and to develop land policies, it is necessary to determine their physical characteristics (borders, cover, etc.) and legal status and to monitor them in time.
- The systematic storage, management, and analysis of legal, value, and use information about the land are realized with land administration systems.
- Although the content and structure of administrative systems differ from country to country, they basically aim to secure rights, provide tax revenue to the state, and facilitate the implementation of land-related policies by administrations.

- The requirements for establishing a standard land administration structure are:
 - Events that cause effects that are not limited to country borders require regional and international land policies. The fact that countries have different land administration systems causes negative effects on interoperability;
 - In addition, in countries where property rights and land registration systems are not developed, the lack of land administration systems causes loss of rights and inefficient use of land inventory;
 - Data standardization affects the effective work of public and private institutions within the country.

- The creation of a common data model standard for all land administration systems in order to solve these problems has been the subject of the late 20th century and early 21st century.
- The Land Administration Domain Model which was standardized by ISO with the efforts of FIG in 2012, has found many application areas.
- LADM includes the goal of redeveloping existing land administration systems according to the model and guiding new systems.

- LADM presents a conceptual model on the rights, restrictions, and responsibilities affecting the land and its geometric components and parties.
- There are many legal impact activities on the ground, above, and below the land. The legal space created by these activities can be represented by LADM.
- LADM allows the model to be supplemented with external packages for situations that cannot be represented in core classes.



- According to the global land administration perspective of Enemark, economic, social, and environmental development can be achieved if the data obtained with the cadastre are supported by the land administration functions.
- Spatial plans are one of the functions of land administration and are not represented in the current version of LADM. But it is one of the goals for the second version.

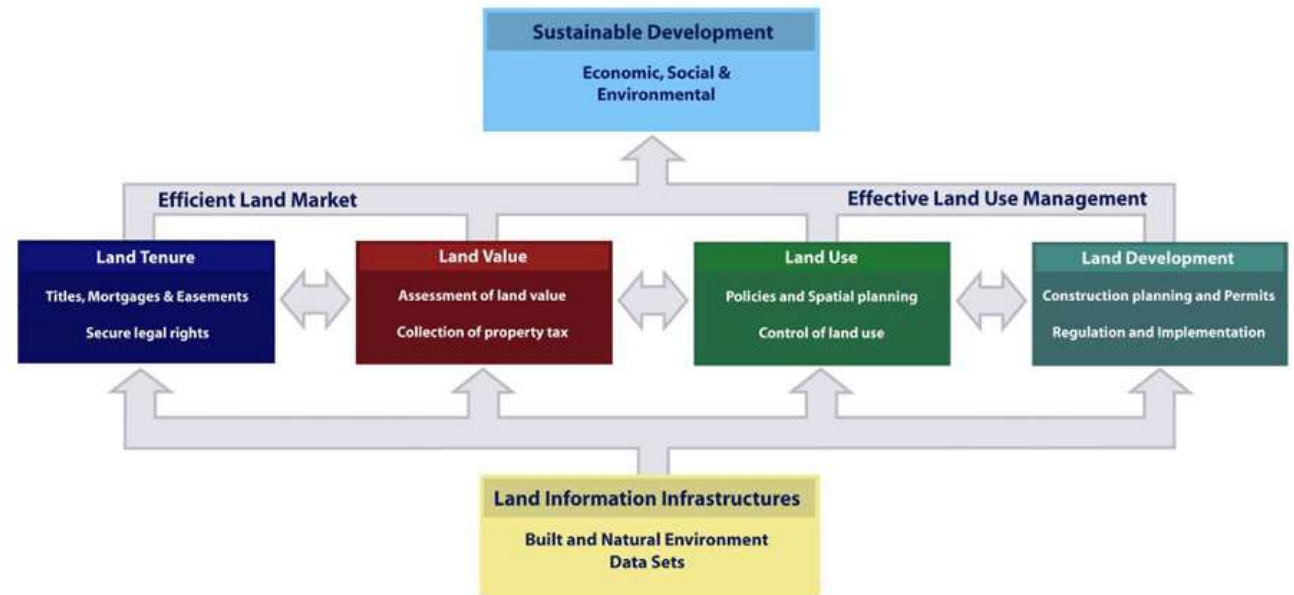


Figure.1 Global land administration perspective (Enemark. 2004)

Spatial plan RRRs

- Various usage and construction functions are assigned to the lands whose physical boundaries are determined by cadastre with spatial plans.
- It also includes a wide range of planned use decisions regarding the future use of the land.

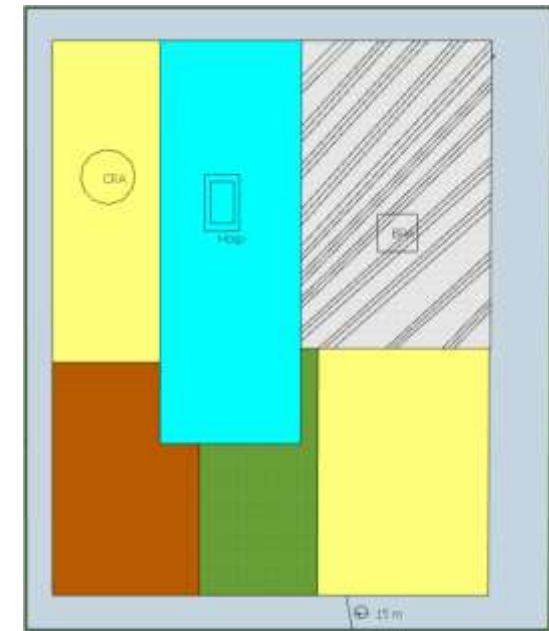
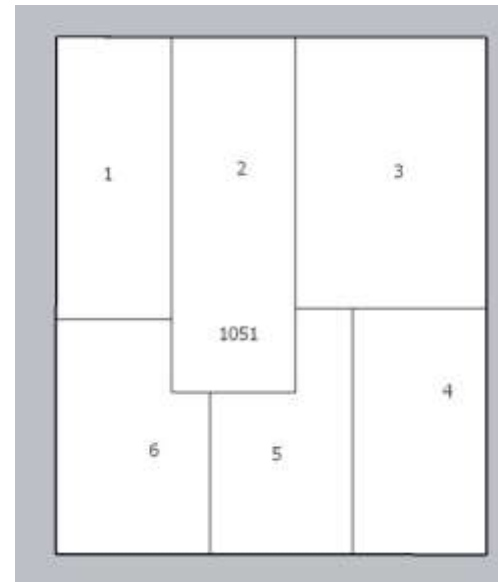


Figure.2 Cadastral and spatial planning activities

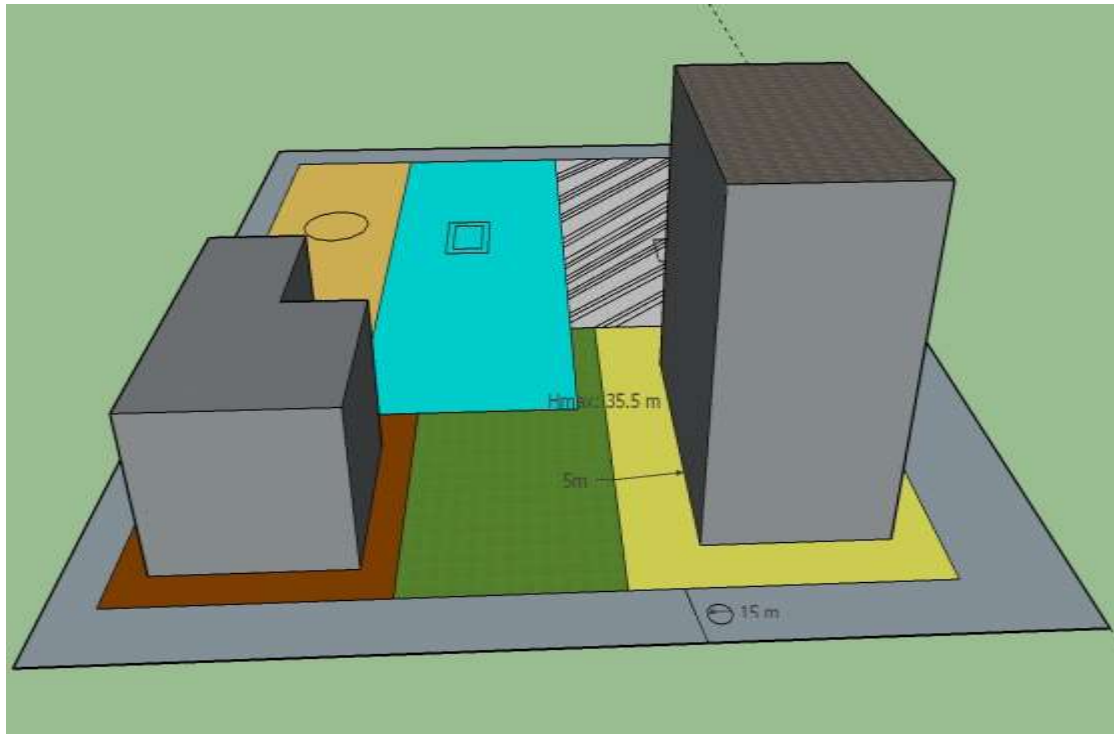


Figure.3 Constructions restrictions such as garden distances and maximum height.

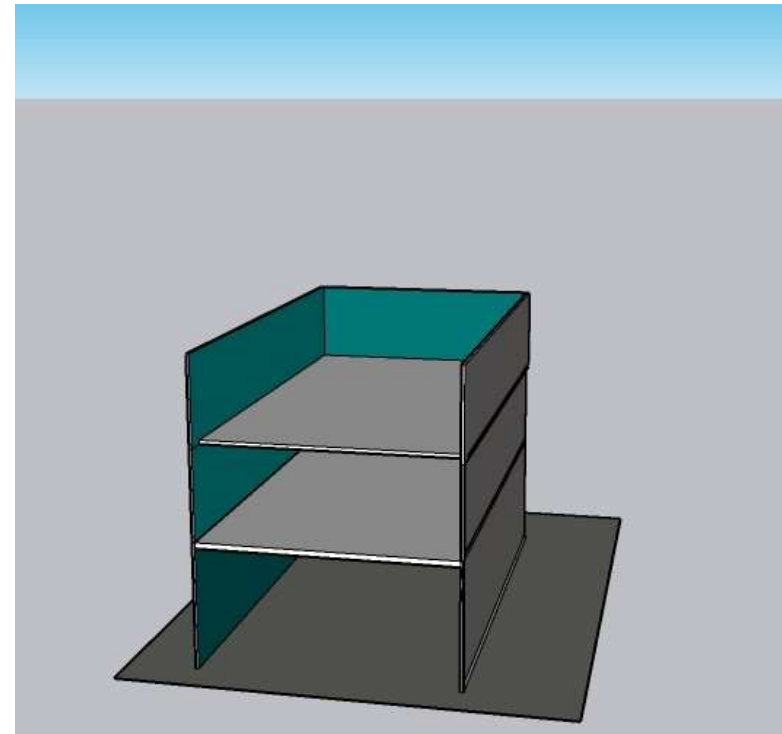


Figure.4 Base and floors area coefficient

Conceptual model design

- LADM represents entity classes and the relationship between classes

using the UML conceptual modeling language.

- Each class corresponds to an entity, and the attributes define the entity.
- Classes to be added externally to LADM should also be designed using UML schemas.

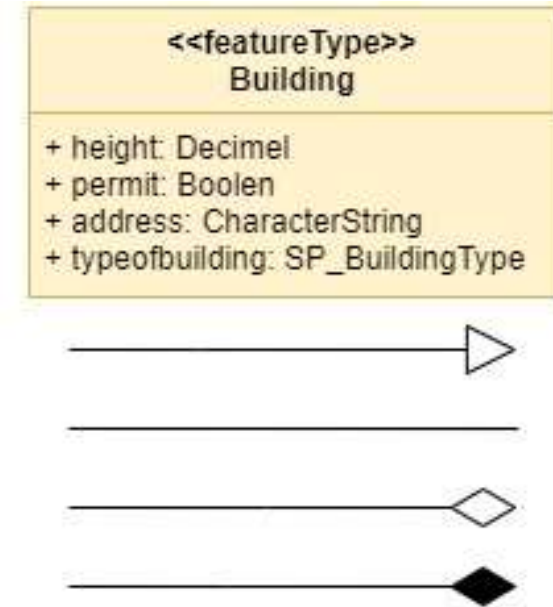


Figure.5 UML class example and commonly used relationships.

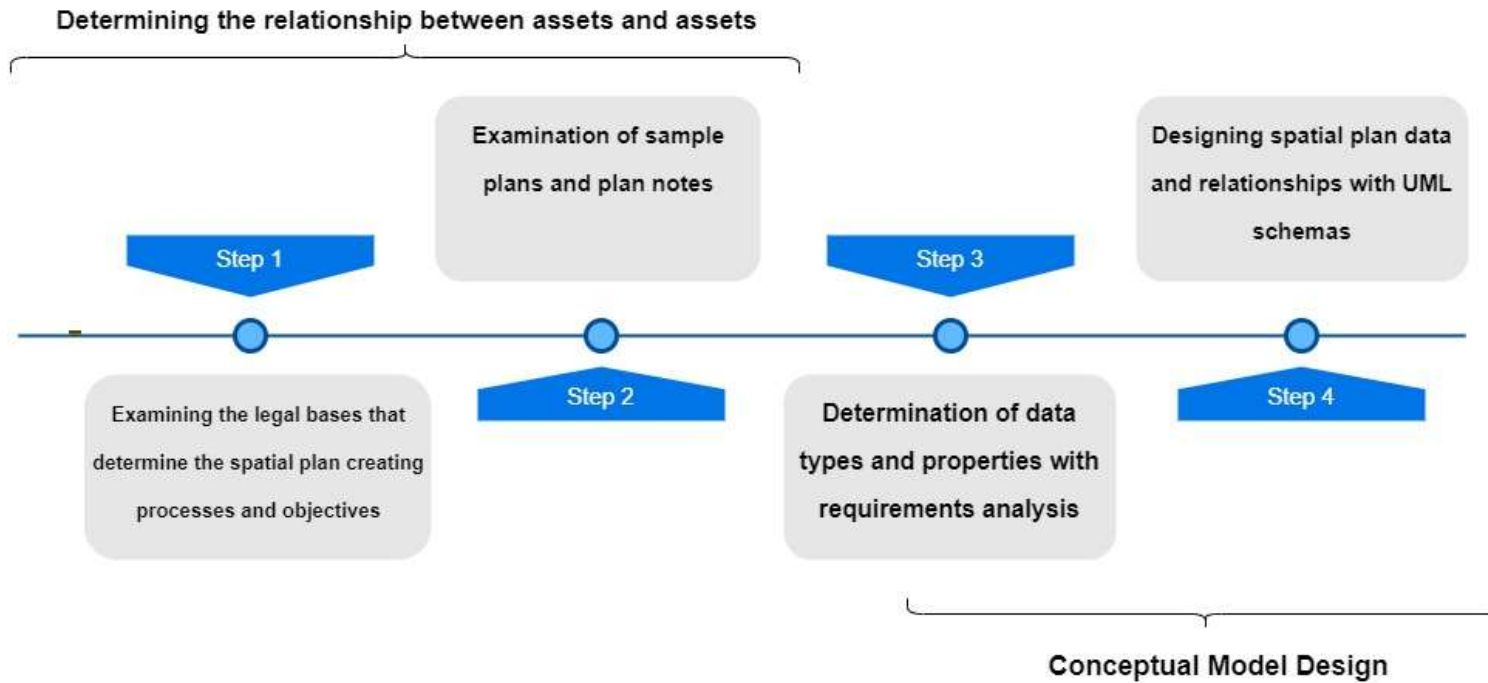


Figure.6 Workflow for conceptual model design

➤ Turkey spatial planning system

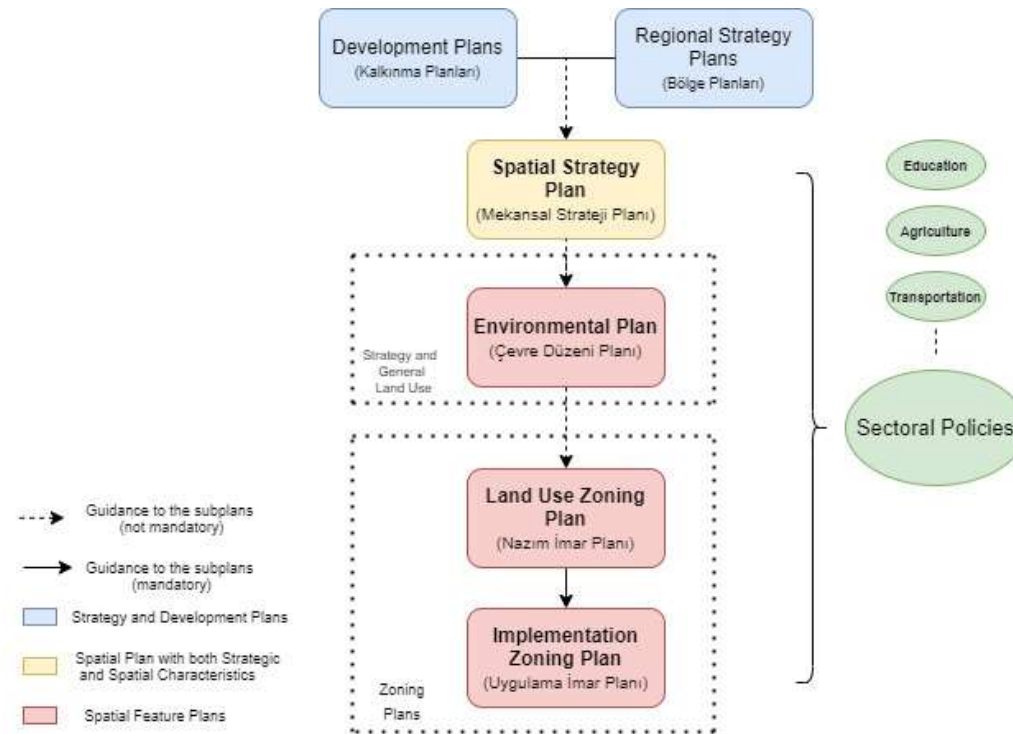


Figure.7 Turkey spatial plans and relationship between them

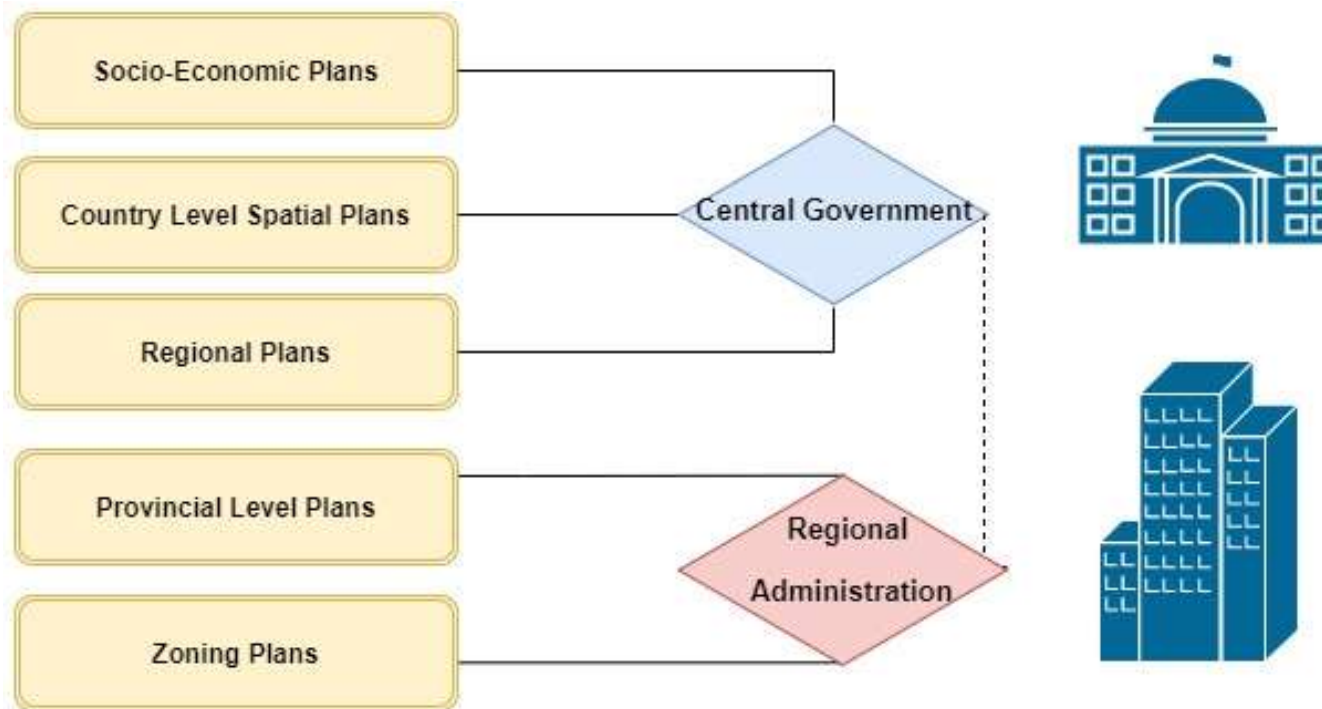


Figure.8 Sharing of authority in planning

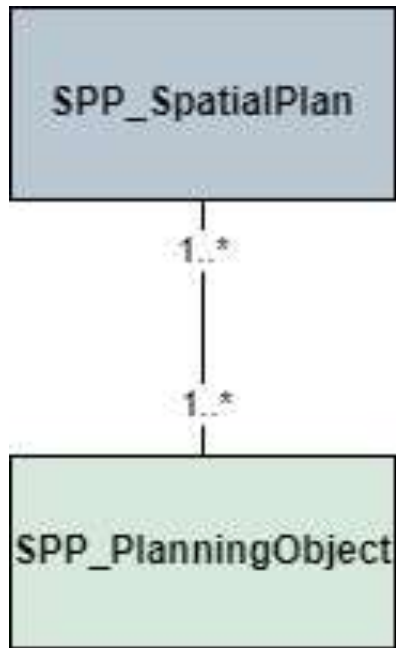


Figure.9 Spatial plans package overview

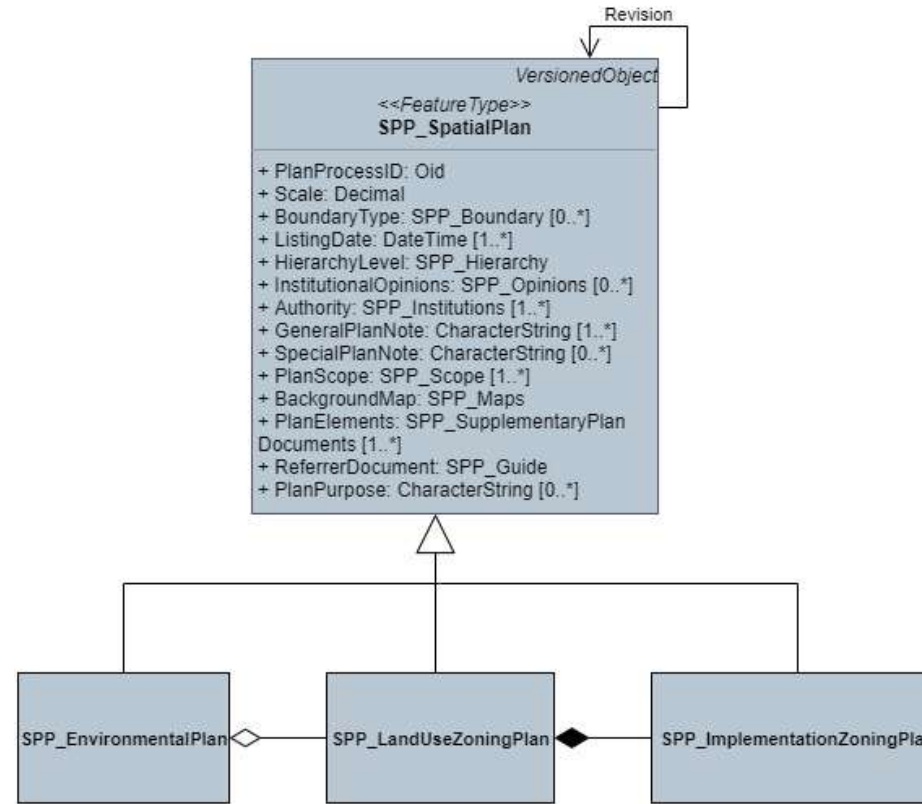


Figure.10 SPP_SpatialPlan classes

- The features of each spatial plan are represented by the SPP_SpatialPlan superclass.
- The relationship between spatial plans is modelled with aggregation and composition relationship types.
- The land use types are represented by code lists according to their categories.
- The spatial objects that exist in the planning region can be represented with the SPP_PlanningObject class.

Conclusion

- Spatial plans include many decisions regarding future land use and construction. These decisions affect many stakeholders and result in various RRRs on lands.
- Spatial plans can be given a standard structure by associating the produced package with LADM core classes. Thus, the goal of a more integrated land administration system can be approached.
- In addition, spatial plan decisions will contribute to the physical model integration studies as they include many decisions about the third dimension of the space.



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