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ASSESSMENT OF CADASTRAL DATA AND URBAN PLANNING INDICATOR CONSISTENCY IN LAND-USE CHANGE: A CASE STUDY OF DROBETA-TURNU SEVERIN, ROMANIA

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Introduction

Accurate cadastral information and coherent urban planning regulations are essential for the efficient use of land in residential development. Property boundaries, land areas, accessibility, and building indicators directly influence construction possibilities and the functional organization of urban plots. This study examines a 450 m^2 cadastral property in Drobeta-Turnu Severin, Mehedinți County, Romania, focusing on the relationship between cadastral data and proposed changes in urban planning regulations. Particular attention is given to the land occupation percentage (POT), land use coefficient (CUT), building setbacks, and the implications of increased construction capacity for residential land development. The accurate correlation of cadastral boundaries and urban planning indicators is essential for ensuring that proposed residential developments comply with spatial and regulatory requirements.

Material and method

The study is based on cadastral documentation, topographic information, and urban planning regulations for a 450 m^2 property identified by cadastral number 59760 in Drobeta-Turnu Severin. Two theoretical development scenarios were compared, using POT values of 30% and 36% and CUT values of 0.50 and 0.60. The maximum building footprints and gross floor areas were calculated for each scenario, together with their absolute and relative differences. The spatial analysis also examined property boundaries, access from Cladovei and Movilei streets, building setbacks, and the distribution of land occupied and unoccupied by construction. The results were interpreted in relation to accessibility, outdoor arrangements, and technical infrastructure requirements.

Result and discussions

The cadastral and urban analysis illustrates the location of the 450 m^2 property and its relationship with surrounding streets and neighboring plots (Fig. 1). The comparison of the two development scenarios highlights the influence of POT and CUT indicators on theoretical construction capacity (Fig. 2). Increasing POT from 30% to 36% raises the maximum building footprint from 135 m^2 to 162 m^2, representing an additional 27 m^2. Similarly, increasing CUT from 0.50 to 0.60 raises the theoretical maximum gross floor area from 225 m^2 to 270 m^2, an increase of 45 m^2 (Fig. 3). Both indicators produce a relative increase of 20% in theoretical construction capacity without changing the cadastral area. The land remaining unoccupied by the building footprint decreases from 315 m^2 to 288 m^2. The proposed spatial organization illustrates the importance of property boundaries, mandatory setbacks, street access, and outdoor spaces when applying urban planning regulations (Fig. 4). The theoretical maximum construction area must therefore be correlated with the actual geometric and functional constraints of the site.

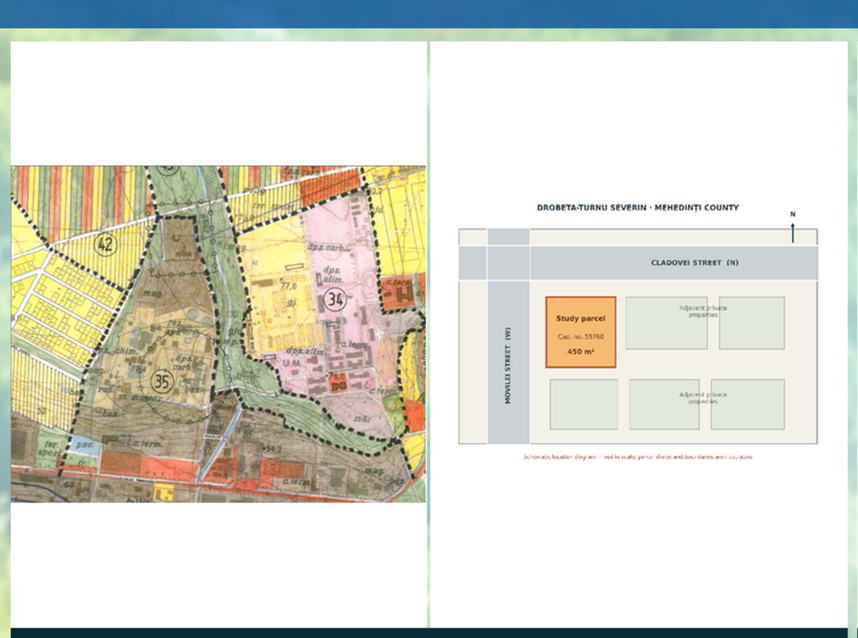

Fig. 1 – Location and cadastral context



Indicator	Scenario 1	Scenario 2	Difference	Relative variation
Land area (m^2)	450	450	0	0%
BCR (%)	30	36	+6 p.p.	+20%
FAR	0.50	0.60	+0.10	+20%
Maximum built-up area (m^2)	135	162	+27	+20%
Maximum gross floor area (m^2)	225	270	+45	+20%

Fig. 2 – Comparison of development scenarios

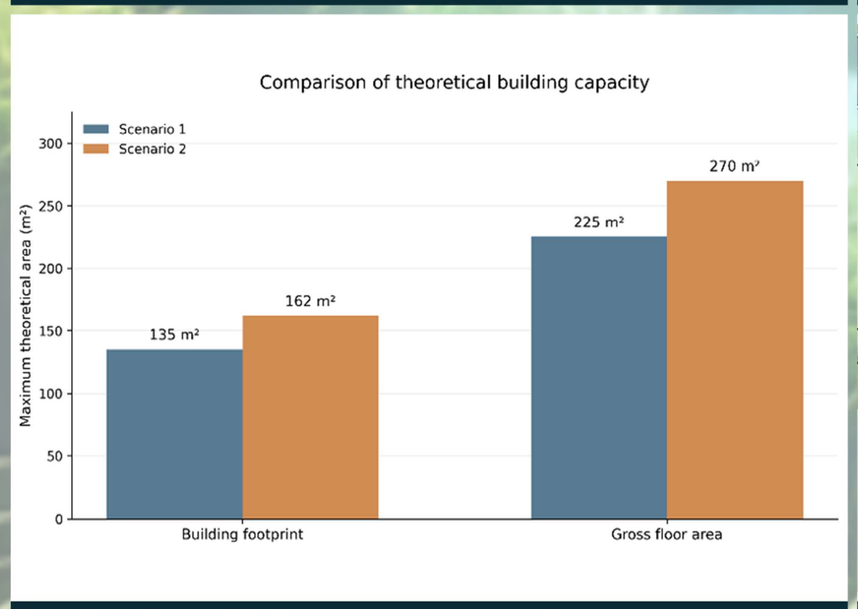

Fig. 3 – Theoretical construction capacity

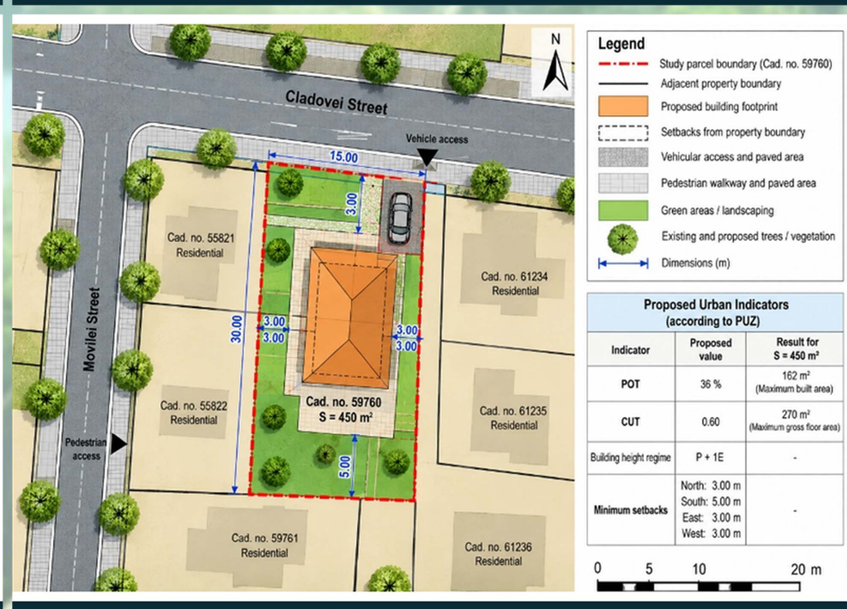

Fig. 4 – Proposed spatial organization

Conclusions

The study highlights the importance of integrating cadastral information and urban planning indicators when assessing residential development potential on small urban plots. For the analyzed 450 m^2 property, increasing POT from 30% to 36% results in a theoretical building footprint increase of 27 m^2, while raising CUT from 0.50 to 0.60 increases the maximum gross floor area by 45 m^2. Both changes represent a 20% increase in theoretical construction capacity. The results emphasize that higher building indicators must be correlated with property boundaries, mandatory setbacks, accessibility, and the organization of unoccupied land. Overall, accurate cadastral documentation and consistent urban planning regulations provide a reliable basis for efficient land use and coherent residential development.

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