Models for architecture of contemporary medium-density mixed-use buildings - case studies from Gliwice, Poland

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Assumption

The demand for density in developing cities is growing since the prices of land are rising and there are nearly no vacant plots in the centres.

Most of the low and medium-density implementations do not use a mix of uses since it complicates the building structure.
Assumption

Mixed-use buildings are objects of more than one use. The structure of a typical mixed-use building allows for access of at least two groups of users: both groups take advantage of the presence of the other one.
Introduction - mix of use

According to Grant (2002, p. 71), the concept of mixed-use has become “a mantra in contemporary planning.”

The Compact City: A Sustainable Urban Form? edited by Mike Jenks, Katie Williams and Elizabeth Burton: It says the compact city is most likely to be brought about by intensifying existing urban areas - increasing densities, activity and the mix of uses - and by attracting people back into the city.
Models for mixed-use buildings in different densities illustrated on the same plot size (grey colors represent non-residential uses) T. Bradecki
Gliwice - location background

Gliwice is a middle-sized city with ca. 180,000 inhabitants, located in southern Poland in the Silesian Metropolitan Area, a large industrial region which slowly starts to shift from industrial use to service use.
Gliwice - location background

The last vacant plots in the city centre are being developed, also revitalisation investments are realized: mostly for commercial and housing uses.
Gliwice - location background

The urban fabric of Gliwice is typical for a contemporary city of historical Medieval origin: its density starts at a very high level in the city centre, decreases to medium in the midtown, and falls to low on the outskirts.

Different densities of Gliwice (high density city center (left) to low density on the outskirts(right); source: http://msip-mapa.um.gliwice.pl/)
Gliwice - location background

high density is defined as a building of medium height (more than 4 stories by Polish regulations), FAR of more than 1.5, medium density is defined as maximum height of 4 floors and FAR of between 0.5 and 1.5, and low density areas are planned for buildings with no more than 2 or 3 floors and FAR of no more that 1 with maximum of 0.5 PCR

Different densities of Gliwice (high density city center (left) to low density on the outskirts(right); source: http://msip-mapa.um.gliwice.pl/
The Kozielska street is an important link between the Gliwice city center and the western part of that city. The site located at Kozielska 6 is very well connected - only 1000 meters away from the market square.
Kozielska 6 case study

The plot at Kozielska 6 covers 931sqm and was vacant for years. In 1990s, there was a temporary pavilion which served as a shop and a fruit market located on the front of Kozielska street. Until 2014, the back part of the plot was undeveloped and covered with bushes, trees, rubbish.
Kozielska 6 case study
Kozielska 6 case study

The design covered 70% of the plot, with the total area of the building of 1,057.32 m². Basic use - commercial – 573.28 m² (54%); additional use: apartments – 484.04 m² (46%) -
Kozielska 6 case study

The basic reason for such a minimum FAR is the required Car parking ratio: the longitudinal length of the plot was too small to design effective undercroft carparking.
Kozielska 6 case study

The initial design assumed: 2 apartments on the second and third floors, commercial space for a pharmacy, a store on the first floor. Terraces located on the roofs constituted additional space that added value to the estate.
Kozielska 6 case study - alternative scenario

The design process lead designers to alternative scenarios with even higher density. Figure 5 shows the density of 2.0 with 3 stories. However, the limit of carparking ratio turned out to be impossible to realize. The plot was too small for designing an undercroft car parking.
Kozielska 6 alternative scenarios MODELS
Kozielska 6 alternative scenarios MODELS
Kozielska 6 case study - implementation

The whole second floor with terraces is being used as dance school (dance academy). Very soon after construction of the building, it turned out that the apartments on the top floor have been rented and used for commercial purposes, also car parking places have been rented and are is not being used for parking cars. Therefore, only 4 car parking places service the building.
Kodzielska 6 alternative scenarios MODELS

nearly 24-hour life can be provided only by one use, commercial use: a dance studio which is located on the top floor: it works mostly in the afternoons.
Kozielska 6 alternative scenarios MODELS

Kozielska 6 shows that sustainability issues can be brought to the city center. The solar cells that have been mounted on the rooftop A terrace is being used (it is not just a standard no use roof)
Florianska case study
Some commercial uses (stores, school, church) are located in the very close neighbourhood.
Single-family housing is located next to the plot and multi-family housing – on the opposite side of the Floriańska street.
Florianska case study

The Floriańska street has regular, calm, residential traffic and provides access to the plot.
Florianska case study

The plot has a close connection to public transport - ca. 400 meters from the Toszecka street.
Florianska case study

The plot covers 843 m2 and is located in the midtown – not so far from the city center, in a residential quarter.
Florianska case study

Initial 2-storey concept failed since mix of use stated in Local Development Plan demanded $\frac{1}{3}$ of commercial use and $\frac{2}{3}$ of residential use
Florianska case study

Architectural model and mixed-use model: commercial use (grey) and residential use on the plot
Florianska case study

aerial view of the neighbourhood (source: maps.google.com) and street view (T. Bradecki)
Florianska case study

The clinic house case study showed that a design of a single-family house with a big commercial programme results in a complicated functional layout but can be delivered in that form.
Conclusions

Both plots were relatively small and that limited the design.

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<th>PCR</th>
<th>FAR</th>
<th>DPH</th>
<th>No. floors</th>
<th>No. of car of parking</th>
<th>Plot area</th>
<th>Total m2</th>
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<td>1057</td>
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<td>0.6 (0.8)</td>
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Conclusions

Both concepts show that very high density can be achieved

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Conclusions

According to the local development plans high car parking ratio is expected.

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Mixing the uses must result in mixing the users at some point, while they use the building or the area.
Conclusions

Local development plans cannot forecast the real need and use: sometimes the real estate market, local conditions and the so called 'life' or users’ preferences prove that the local demand is slightly different to the regulations
Conclusions

Medium-density buildings very often must be constructed on small plots, which make the design solutions complicated.

model approach depends to a high degree on the architecture and the location.
References


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THANK YOU

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