

Summary: Possibilities of reduction of costs at traffic development of building sites and buildings

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1. Problems and goals

Building in cost- and floorspace-saving manner gets more and more important because of steadily decreasing development sites, continuously increasing landprices as well as persistent demand of living space for reasonable prices. The discussion on costsaving building is not restricted to building construction but is also including economic traffic development. At new residential areas the more intense use of traffic areas gives several possibilities to save building and living costs, e. g.

- minimizing the road infrastructure areas (up to the minimum development)
- optimizing the public use of roadside environment (multiple use)
- modifying the strong separation of private and public parking lots (multiple use outside the real properties) and
- step by step developping of road infrastructure.

In this research project it is studied if it is possible and which special requirements have to be met to save costs by minimizing the road infrastructure of residential areas and of whole urban areas.

2. Research structure

Under consideration of the aims of the research work, founded on an all-embracing research approach, there have been set three inquiry centres. The present state of knowledge has been pointed out by an extensive **analysis of literature** and the employment criterions, which are used in the planning practice and are based on the current design standards, have been shown. According to selected **case studies**, there areas of analysis have been chosen to examine the use and the success of the minimum requirements for road infrastructure prescribed in the current design standards. As well further useable margins should be found out. The inquired residential areas and urban areas are of different size, density and social structure. One of these areas is a high-rise building area and one is completely traffic restraint. The third research part contains **empirical researches** about parking and flowing traffic and about the needed area size. The result of this research work is used for developing conclusions and recommendations for multiple use of development construction, step by step development of infrastructure, planning of development road network and for the planning process.

3. Result of research

Analysis of literature

The result of the analysis of literature is that the largest capacities for cost-saving can be seen at the building costs. Furthermore, there is the possibility saving money by reducing the areas for road infrastructure. Most of the evaluated literature is examining cross sections. Research work about whole network is hardly existing. Constituting the foundations for cost- and floorspace-saving building the laying down of the local plan is of great importance. Also it is demanded in a plain way to check and to modify legal and administrative instructions in order to enlarge the flexibility of planning and the transparency of the actual costs.

Case studies

The examination of 17 residential and urban areas has shown that the minimum requirements for road infrastructure prescribed in the current design standards have been used in all quarters - independent of the size of the area. The saving of floorspace by full savoring the limits is insignificant. In most of the examined areas a large uncertainty in dealing with road classification is evident. Because of that, many oversized roadside environments, needing large areas and gearing towards function, are existing. They are contradictory to building in floorspace-saving manner and to the multifunctional use of roadside environment. On account of the manifold demands for using and of the mainly very low traffic volume, the road design in residential areas could be a mix of the areas the different road users more often. Too low development according to insufficient or not functioning reach of building sites has not been regarded in any case. The positive effects of complete traffic restraint areas on the quality of living are realized by the community, the investors and the inhabitants. Nevertheless, there are only a very few examples of these quarters and further concepts have great difficulties in being accepted.

Empirical research

The census of parking traffic shows that there are too many parking lots in areas of supported house building. In areas with detached houses the capacity is more fulfilled but there are still some reserves. Garages in this areas are often used for other purposes than for the accommodation of cars. Many cars are parking on the road - in addition to the parking lots which are marked in the road environment. The cars of visitors will not give rise to a higher use of capacity because there are enough free parking lots during daytime. Because of the rising amount of cars in the early afternoon and because these cars are not placed together in groups it is hardly possible to use road environment for other business than traffic.

The census of flowing traffic shows in most of the residential areas a very low traffic intensity. Even in the high-rise building area with many living units at each access road the traffic intensity kept under 100 pcu. Access roads with local distributing function are often oversized because the traffic intensity only has the same size than at the access roads but they are structured like common local distributor roads. Considering all these facts there have to be developed new design standards and minimum widths than they are used in today's planning

practice.

To investigate area size, the existing development concept has been compared with fictitious models basing on an economical concept or basing on a concept without any parking lots. The calculations about the needed area size make clear that floorspace-saving is possible - even if the cross-sections are not of the smallest possible size. This could be essential to underline the hierarchy of the network lineout and to preserve a good quality of roadside environment. The share of the traffic area can be reduced from 13 % to 27 %. This means that the size of the building sites gets larger and that the gross development area can be used more economical (2,3 % to 4,9 %). Additional floorspace-saving by renunciation of parking lots is almost impossible because all real estates have to be reachable by cars. Only complete traffic restraint areas with reduction of car ownership or without any cars at all enables more floorspace-saving.

4. Recommendations

Deducing from the conclusions of the research work the following recommendations can be given:

Possibilities of multiple use

- Renunciation of calculated assignment of parking lots in large residential areas
- Renunciation of assigned parking lots in the roadside environment of modern estates
- Inclusion of private parking lots in all-embracing and graduated operation concepts
- Assignment of parking lots with temporal restrictions in roadside environment or at car parks (multiple use, e. g. for children's game)
- Establishing temporal restricted complete traffic restraint areas by operational or constructional measures
- Examining the possible use of local distributor roads in the outskirts of towns as relief roads or as parts of by-pass roads

Possibilities for step by step extension and operation of road infrastructure

- Involving of dynamic elements to the design standards
- Further reduction of parking lots in areas of supported house building
- Lasting arrangement of spare areas not needed in the future
- Consideration of the inhabitant's further age distribution
- Step by step development of building areas

Development road network

- Stronger consideration of sustainable town planning and good quality of roadside environment by multiple use of space and revised design standards
- Working out design standards for small residential areas considering economical network planning

- Full savoring the limits of different classified roads given in the design standards
- Revising the recommended limits for realising a mix of the areas for different road users
- Drawing up a guide for the planning praxis considering different structural densities

Planning process

- Laying down the planning goals with the beginning of the planning because it is not possible to fulfill all goals (high structural density, parking lots for everyone near the flats, enough free space for all possible use, floorpace-saving building and high quality of roadside environment)

5. Final recommendations for the future

The conclusions and recommendations worked out by this research work should be added to the respective design standards. Besides it is to examine if new design standards for small residential areas are practical. After deepening the conclusions new amendments should be developed, e. g. the decree about parking lots, about paying for traffic development and about traffic signing. For an easier use of the different standards a guide for the planning praxis should be worked out. The aim of this guide has to be the avoidance of oversized development, the guarantee of the reachability of all building sites, the attainment of high environmental quality and the establishment of multiple use considering an all-embracing planning approach.