

# Development of Solutions for Converting Existing Pre-fabricated Wooden Houses Following the Criteria of Universal Design

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## Initial Situation

In the aging society, there is demand for adjusting residential homes to their users' needs. Structurally converting existing homes may guarantee to live self-determined lives within the familiar environment also in old age. The project applied for was to determine the possibilities of a holistic conversion of existing pre-fabricated buildings to become barrier-free and to work out a catalogue of solutions for conversion measures. The solutions were expected to be checked and transferred to target groups (users, builders, etc.) by way of visualised exemplary developments.

## Objective

It was the objective of the project to develop sustainable solutions to make existing detached houses – with a special focus on pre-fabricated houses in wood-frame design – fit for their inhabitants to continue living there until the end of their lives. So far, there has been no knowledge or experience how existing pre-fabricated houses in wood-frame or wood-panel design may expertly and economically be converted. As these pre-fabricated houses prevail in almost standardised form, generally applicable rules were expected to be set up for these types of houses.

By elaborating suggestions to convert existing pre-fabricated houses meeting the needs of elderly occupants or those with disabilities, their social contacts should be maintained, their quality of living improved, their housing situation re-structured and new fields of business be opened up for building firms.

It was the project's goal to

- work out generally utilisable planning documentation for the old-age-relevant conversion of pre-fabricated wooden houses with sustainable building in mind,
- develop suggestions for conversion measures and examples for their implementation,
- to prepare technical papers and tools to visualise such implementation of the planning documentation and suggestions to target groups.

## Approach and Results

Starting out from analyzing the requirements of the occupants and of the existing housing stock of pre-fabricated houses in wooden-frame architecture, necessary conversion scenarios were worked out. For comprehensively describing the individual conversion desires and possibilities, it became necessary to work out a catalogue of features. Such catalogue comprised these categories:

- useful residential space,
- occupants' purchasing power,
- number of occupants,
- physical constitution,
- cognitive competence,
- competence of sensory perception,
- needs for comfort,
- needs for security,
- preparedness for change

and allocated to one of three degrees.

Furthermore, differentiation was made into preventive and situative conversion. An exemplary planning review was prepared for four residential types of pre-fabricated homes, including technical solutions of details for the wooden-frame design considering the special requirements of the wet area

(Fig. 1). Flexible use of the living space, possibilities of conversion and adjustment of windows and doors and for installing an elevator were also considered. The preparation of concepts for stow-away areas for small room corners followed. The knowledge gained helped to set up a feature-based catalogue of measures providing conversion suggestions for the respective degrees of needs.

The results were presented in information brochures and their usefulness was cross-checked by surveys of occupants of detached houses and rented apartments (n= 22), architects (n=24), crafts-

men (n=14), builders of pre-fabricated houses (n=3) and providers of living space/landlords/real estate agencies (n=6, covering 14,828 residential units altogether). The users' responsiveness was mainly positive. The suggested two-stage concept of preventive and reactive measures was very well accepted by the majority (91 %) of respondents. If the suggested measures did not have the character of a conversion for people with disabilities, which is sensed to be stigmatising, they were accepted by the respondents. This is feasible by adopting preventive measures.



Fig. 1: Example of a conversion with explanations (taken from an information brochure)