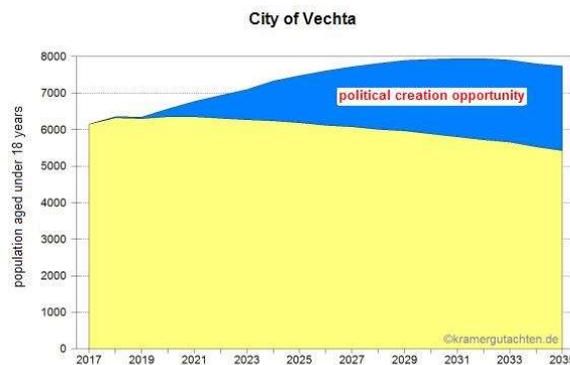


Population Analysis and Projections for Small Communities by Application of System Dynamics

by Peter H. Kramer

We will increase the practicability of politic, support the local administration essentially and we will strengthen the efficiency of acting. Therefore you will have a comprehensive knowledge of running proceedings and regulation. Our performance is based upon the theory of complex systems. We won't make decisions, we will show the opportunities and the resulting consequences.

Population projection in small communities is more difficult then nations, because local administration and actors always influence the development strongly. The result is a couple of different initial positions and dynamics. But we need information to develop our local authorities successfully. How do we solve the problem?



At first we examine and describe the system, including all significant system elements and their causal linkage. Then the system structure is translated into a computer simulation model which allows complex and realistic computer simulation. A complete description of the initial system state i.e. the initial conditions necessary for starting the calculation. Scenarios for the temporal development of external influences over the time period considered. The scenario data will consist of assumptions concerning plausible and likely development conditions. Several scenarios characterized by different guiding aspects (basic ideas, central themes) should cover the total spectrum of real possible exogenous influences in order to access the resulting consequences and developments.

We simulate the development of the population and houses in different residential quarters in small time steps (less than a year) up to 2035. The validity of the simulation model are proved by the reconstruction of the past only by changing the external influences.

We divided the community into areas with similar environment and hence similar demographic pattern. This includes reason and behavior by different kind of migrate or immigrate, which also influence the fertility and mortality. So you can discover the opportunities and resulting consequences including the topics: housing, household, nursery school, kindergarten, school system, playground, sports, cemetery and so on.

Since 1996 we have examined more then 70 communities from 2.000 to 80.000 inhabitants in northern Germany. We also examine the resulting consequences and improve the development of great new housing areas.

Does the simulation works?

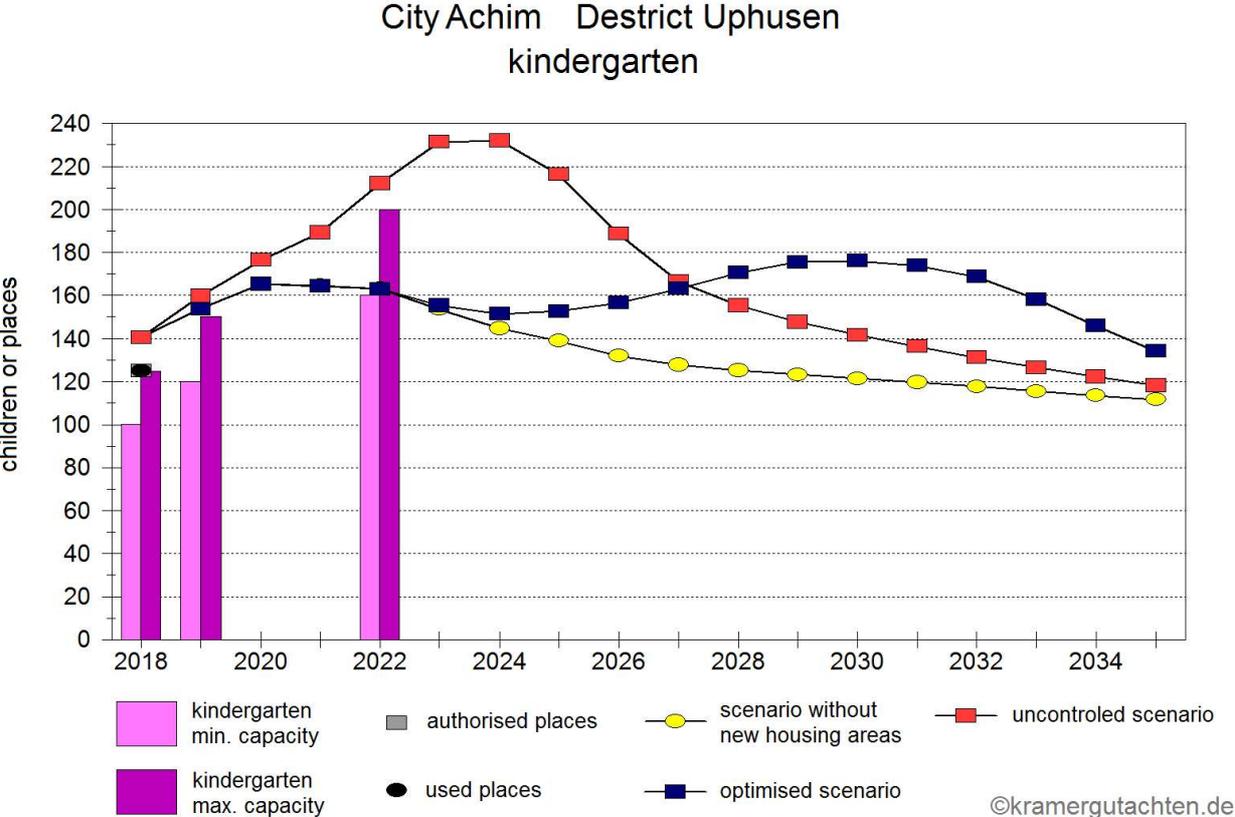
An example: Hessisch Oldendorf

Hessisch Oldendorf Date 31.12.2016 Age Group	real	Simulation A-Scenario	Simulation B-Scenario
below 3	481	461	558
3 – 6	466	462	549
6 – 10	660	658	772
10 – 18	1.492	1.491	1.565
18 – 25	1.482	1.556	1.577
25 – 45	4.377	4.526	4.792
45 – 65	6.316	6.634	6.709
65 – 75	2.010	2.033	2.045
75 and over	2.345	2.256	2.258
total	19.629	20.077	20.825

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The community decide to carry out the less expansive A-Scenario. The simulation was made in 2004. After 12 years there are only view discrepancy. The city permitted a bigger senior citizens home and they do over years nothing against the emigration of younger people. This was a political decision and not a simulation imperfection.

Time flies ... The simulation model shows not only the development of population and houses. It give you the opportunity to manage the evolution of a city. But only few communities start this next step into a more democratic and sustainable future. In the neighborhood of the city Bremen is the much smaller town Achim located. The community of Achim has 30.000 inhabitants. The growth of the infrastructure shall be harmonized with the growth of new housing areas. At first we simulate what happens wen the plan of a new housing area will come reality as planned, especially the resulting in case of the expensive kindergartens and schools. Next we chance the art, time and scale to optimize the proceeding. If an investor insist on making his plan, we calculate the costs and he will pay and do so.



But our proceeding is still unusual and unique. The most administration in Germany concludes from planned flats (apartments) direct to children. It means, they believe that new housing bear not growing people. They also believe in population projections without any democratic opportunities.

Sapere aude!

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Who is Peter H. Kramer ?

Born 1956 in Elze. A very small town in germany, same as the mathematician Johann Heinrich Louis Krüger (1857–1923) and Philipp Furtwängler (1869–1940). First he works as an aircraft maintenance technician. Then he studies urban planning at the University of Kassel. First science steps: Environmental system analysis (Club of Rome) and “Future Prospects of Agriculture in the New German Bundesländer” in order of the European Parliament, Scientific and Technological Options Assessment (STOA). Since 1992 leader of his own institute with round about one hundred expert opinions and studies in urban systems.