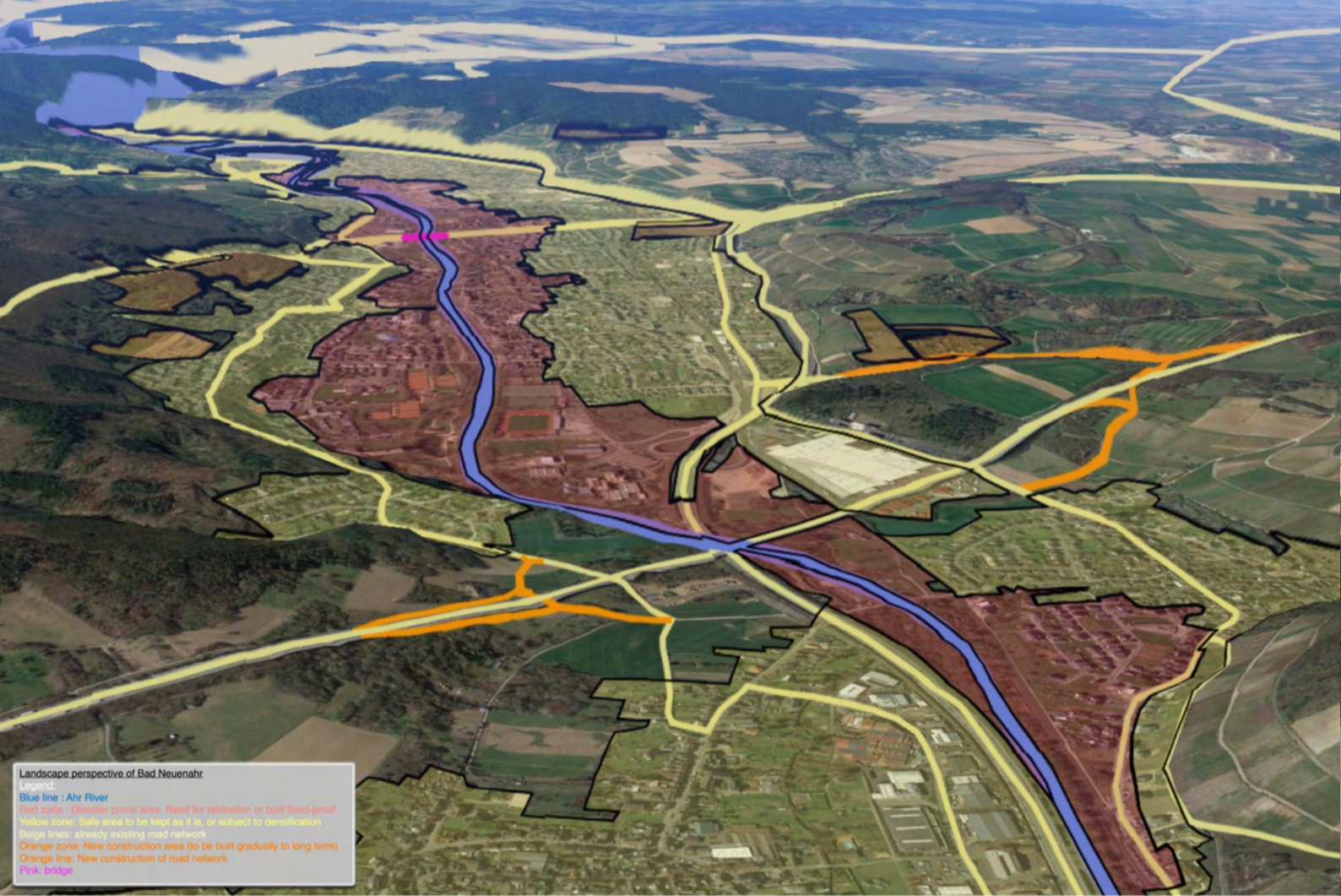




Photo: Bendik Fiske



Landscape perspective of Bad Neuenahr
Legend:
Blue line : Ahr River
Red zone : Disaster prone areas. Need for relocation or built flood-proof
Yellow zone : Safe area to be kept as it is, or subject to densification
Beige lines: already existing road network
Orange zone : New construction area (to be built gradually to long term)
Orange line : New construction of road network
Pink: bridge

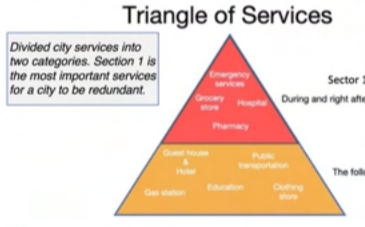
Investigation
Through the investigation I mapped the most critical services needed during a disaster, which is demonstrated in sector 1 in the 'triangle of services', to the right.

It was evident that the distribution of services often are unequally distributed, which leaves certain inhabitants of the villages/cities left alone during disasterous times. Thus, I focused on establishing new infrastructure that provides services for everyone, despite which side of the river they live.

I find it essential to improve the road network in order to allow people to get in and out of the villages/cities, to maintain a connection to the outside, despite bridges being broken during a disaster. The distance between critical services and each city part were taken into consideration, in order to improve the efficiency of navigation during emergency situations.

I looked into using and improving the access to already existing infrastructure in the areas. One example of this is the large highway bridge that crosses Bad Neuenahr, which can be used more efficiently by connecting each city halve to each other, and more importantly - to the outside regions.

A map providing overview of the area. Showing the existing road network of a part of the Ahr Valley (Bad Neuenahr, Dernau, Rech, Maychoss, Altenahr and Kreuzberg etc.) in Germany.



Location of sector 1 services.
Legend:
Purple pin = pharmacy
Pink pin (H) = hospital
Green pin = grocery store
Red pin = fire station
Red pin (X) = fire station which ought to be relocated
Blue pin = police station



Based on this information, I went on and investigated the existing road network, and located where connections to the outside of the valley could be made. In addition, it was investigated where it is safe or unsafe for people to live or work, based on the HQ100 line.
We used the HQ100 line to map the level of safety in the valley, because it demonstrates what areas were submerged in water, and ultimately the territory of the true river bed.
Areas that are prone to flooding were marked as red zones, and areas that remained safe were marked as yellow zones. However, the yellow zones may still be affected by isolation during flooding due to road network and bridges being destroyed, which further may cause emergency services to be unable to reach certain areas.
Therefore, it was focused on solutions concerning distribution and distance to services and infrastructure, as well as a functioning road network and connection between the villages and to the outside. This is demonstrated with orange zones, on the next slide.

Maps demonstrating how each village / city are affected by flooding, based on HQ100 line

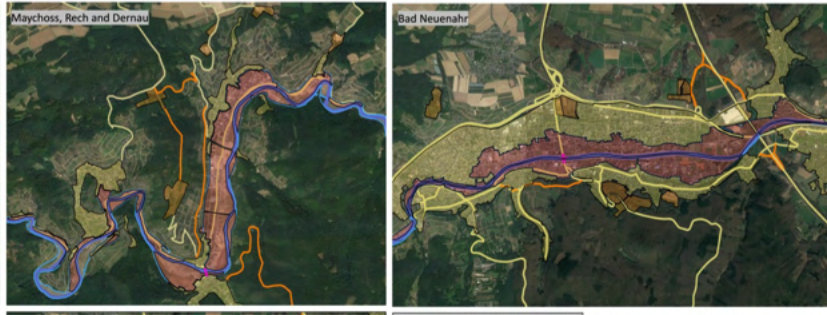
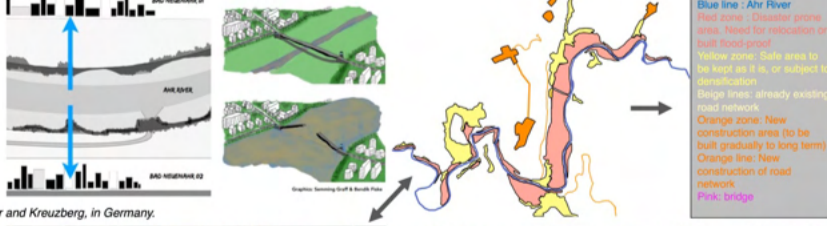


Proposal

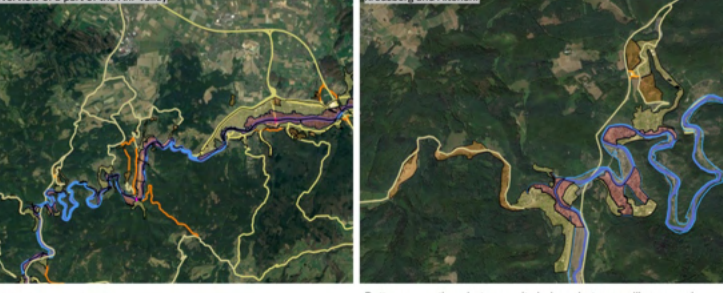
REDUNDANCY

The concept of redundancy
Based on the principle of redundancy, I suggest creating two autarkic city halves, that, in case of flooding, continue operating. By that, we can provide more space for the river because the city halves recede from the riverbed. With two autarkic city halves, there ought to be essential infrastructure more equally distributed on both sides. This is so that they can function more independently from each other, as well as providing critical services and infrastructure to all inhabitants in the entire city at all times, especially during potential catastrophe.

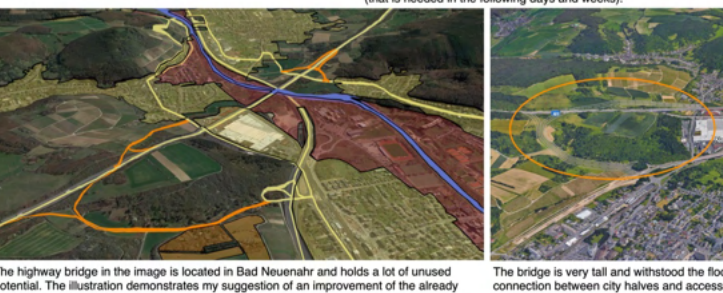
Maps providing overview of the area. Marked with suggestions for future development of Bad Neuenahr, Dernau, Rech, Maychoss, Altenahr and Kreuzberg, in Germany.



I urge the yellow zones to be built on first and subject to densification, because these areas already are quite populated and developed, and are considered safe. The orange zones are suggested to gradually move people away from the river area, in order to save more space for it, and ultimately improve the inhabitants of the area's coexistence with this natural phenomena.



Better connections between city halves, between villages, and between the valley and the outside is also needed, and can improve the efficiency of emergency services etc. significantly.
The idea is that each village / city ought to be redundant and have sufficient infrastructure and services to manage itself for a while, especially sector 1 services (demonstrated with suggestions, to the right). However, it is limits to how long one can survive without connection to the outside concerning supply of essential needs, like food, medicine, shelter etc. Take a look at the 'triangle of services' on the previous slide, to get an overview of the sector 1 services (that is needed during disaster and right after disaster), and sector 2 services (that is needed in the following days and weeks).



The highway bridge in the image is located in Bad Neuenahr and holds a lot of unused potential. The illustration demonstrates my suggestion of an improvement of the already existing roads to access the existing highway. Such interventions can allow both sides of a city to be equally developed and attractive, and also allow emergency services to enter where it is needed.



The bridge is very tall and withstood the flood of 2021. This suggestion will improve connection between city halves and access to outside assistance during future flooding and emergency. It can also improve the coordination and reliance of emergency assistance, unaffected by where disaster may occur.

Improved access to the highway will make emergency services able to get around during disaster, which provides more security for all citizens, and a more just society. Better connection can also motivate and allow people to move to areas that previously were considered unattractive, because it is easier to reach critical infrastructure and services. All of these factors can motivate villages/cities to be more redundant, vibrant, just and secure, and at the same time let the river reclaim its territory.