



# Flood Prevention vs. Brownfield Development Constraints and Challenges for the Municipality of Frankfurt (Oder), Germany

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**Flood Prevention vs. Brownfield  
Development**  
**Constraints and Challenges for the  
Municipality of Frankfurt (Oder), Germany**

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# Outline

- **Introduction**

- Frankfurt (Oder): location & topography**
  - Past flood events**

- **Flood Prevention – Urban Development**

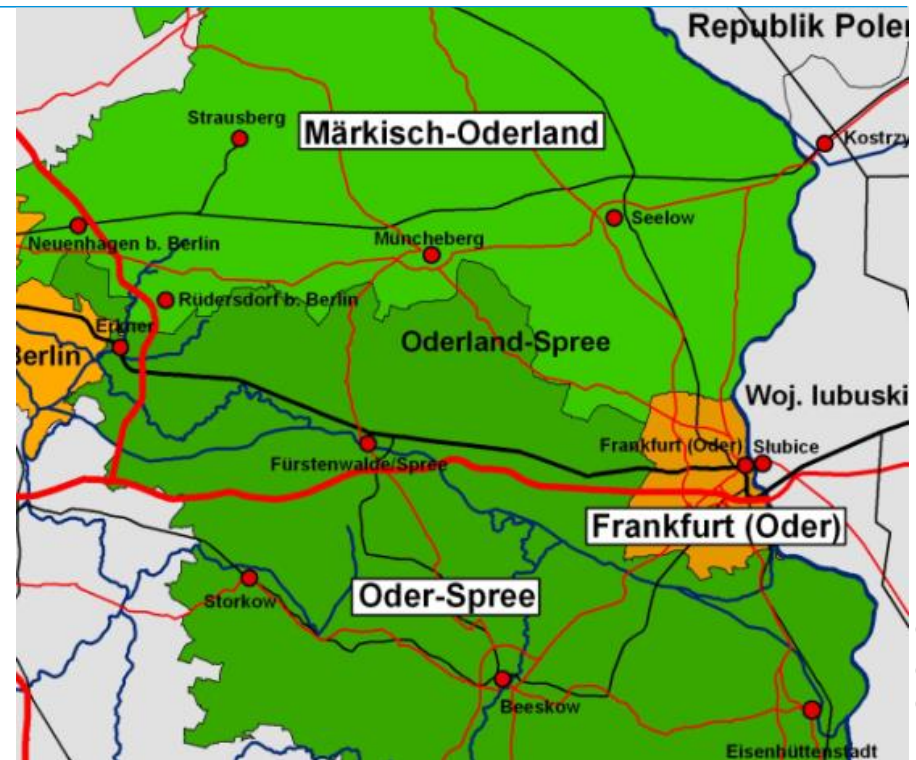
- Current Flood Exposure and Risk**
  - Urban Development Objectives for the Inner-City**
  - Constraints by Flood-Plain Designation**

- **Challenges & Approaches**

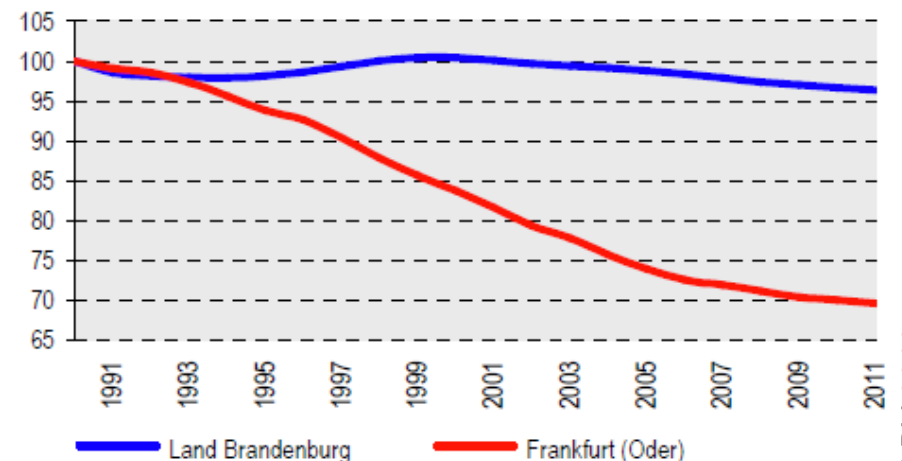
- Reclaiming of Retention Space**
  - Paradigm Shift towards Flood-Adapted Urban Development**

# Frankfurt (Oder)

- located at the German-Polish border approx. 80km east of Berlin
- “regional centre” for the eastern part of Brandenburg
- fourth largest city of Brandenburg with approx. 58,000 inhabitants
- loss of almost one-third of inhabitants since 1990



Bevölkerungsentwicklung bis 2011 (1990 = 100)

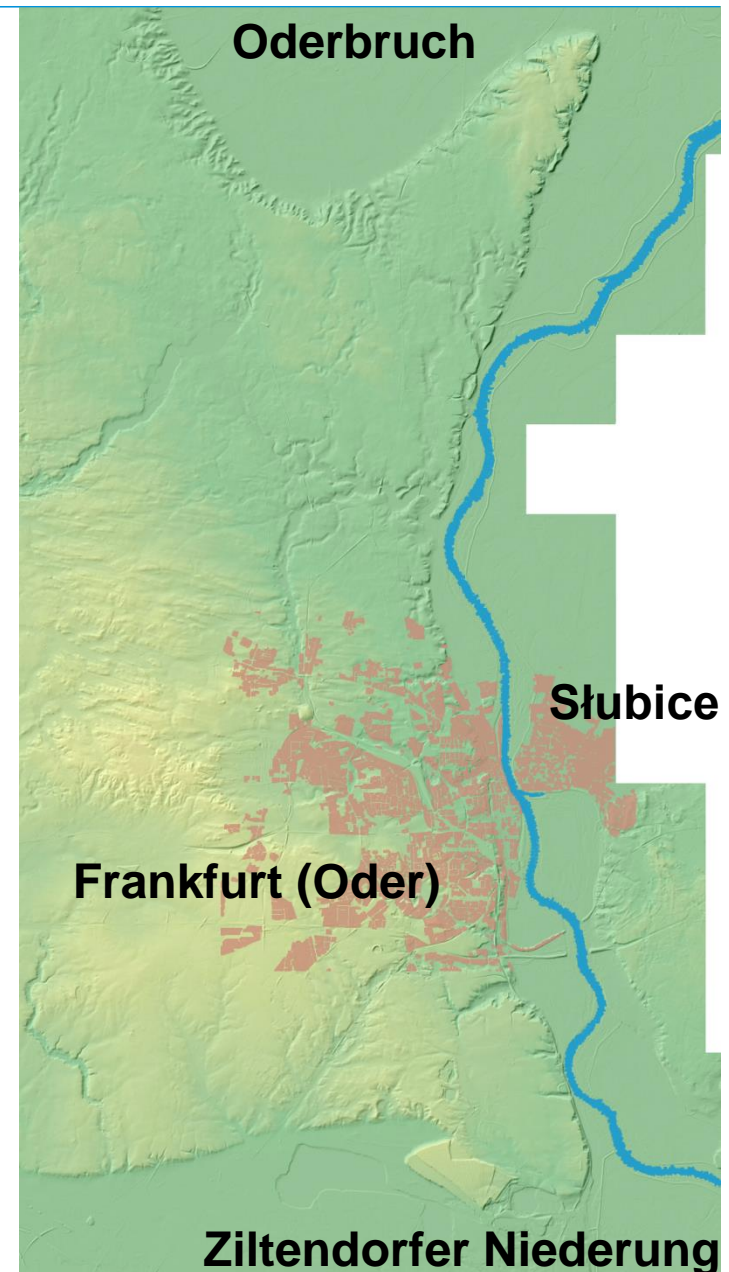




# Frankfurt (Oder)

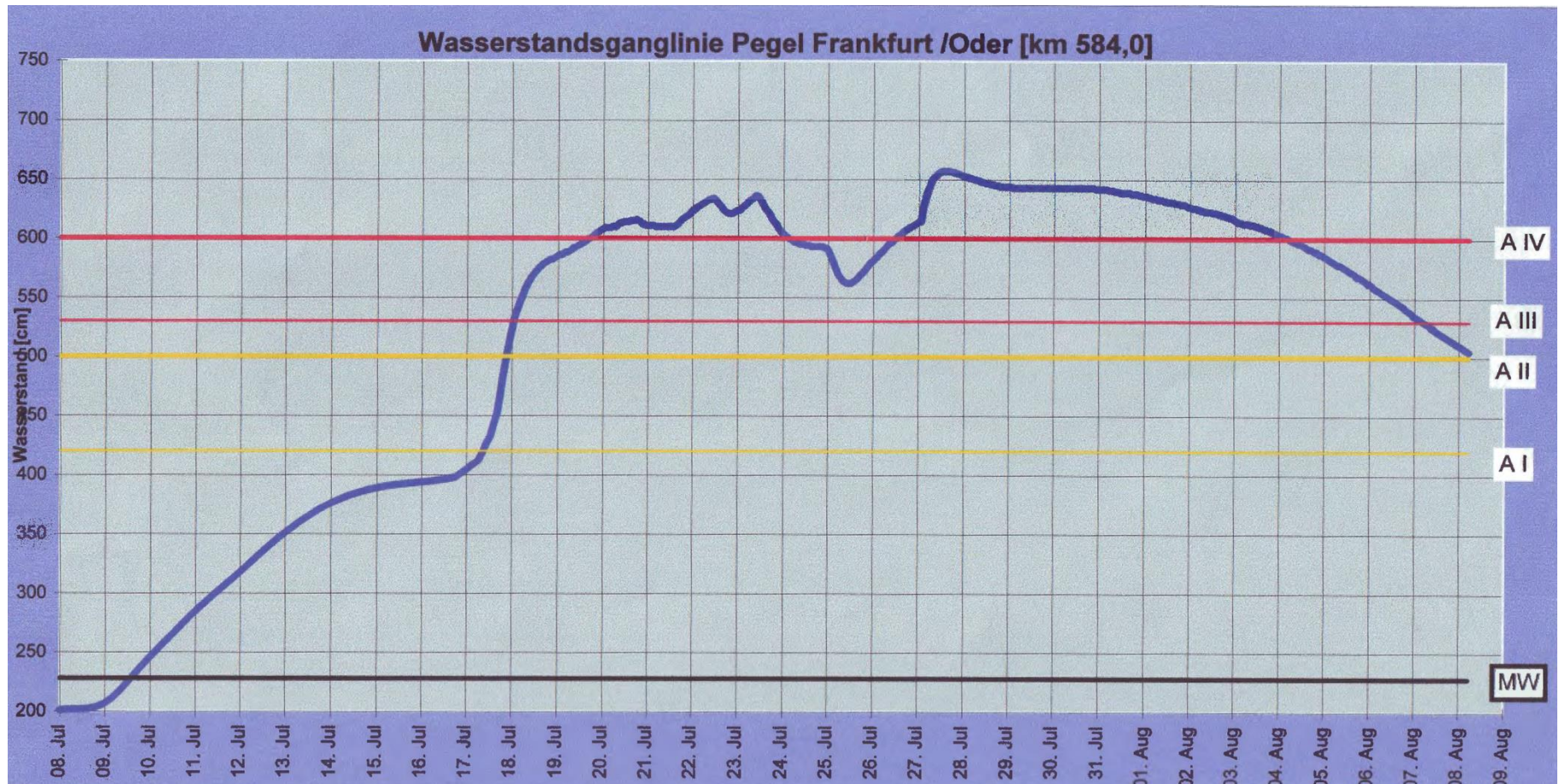
- located at the middle reach and the western banks of the river Oder
- opposite to the Polish city of Słubice
- located on the “Lebuser Platte” – glacial elevated plain
- Frankfurt generally less vulnerable than low-lying, reclaimed land on former floodplains (Oderbruch, Ziltendorfer Niederung)

LGB 2014



# Flood Event 1997

WSA/ LUA 1997



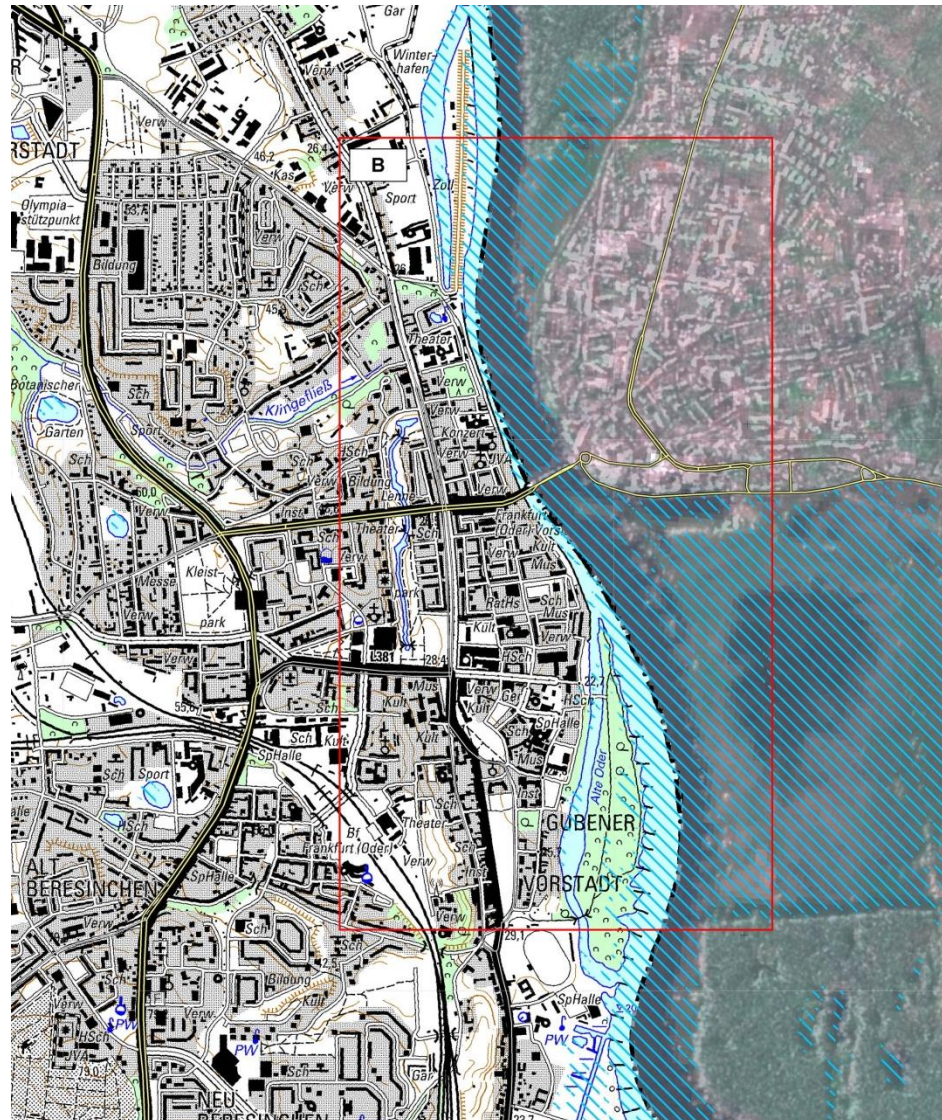


# Flood Event 1997





# Flood Event 2010

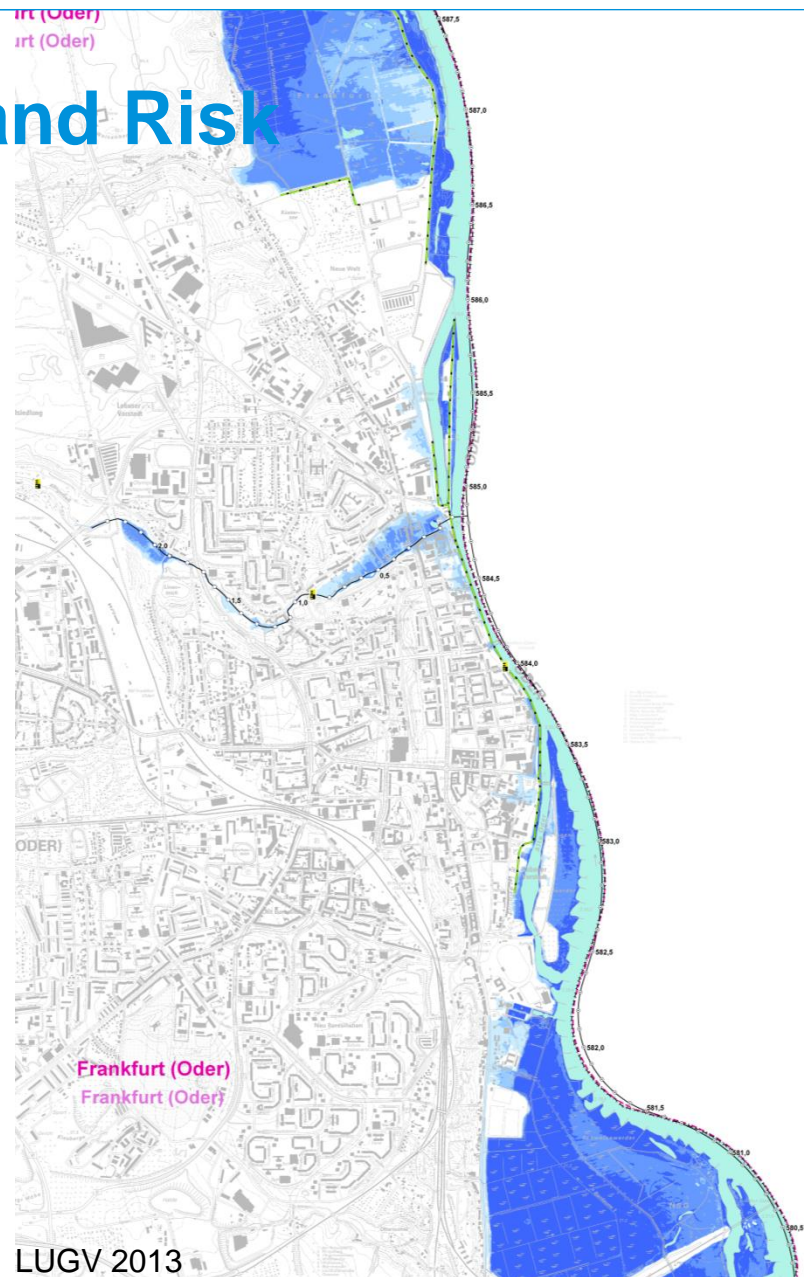


DLR 2010

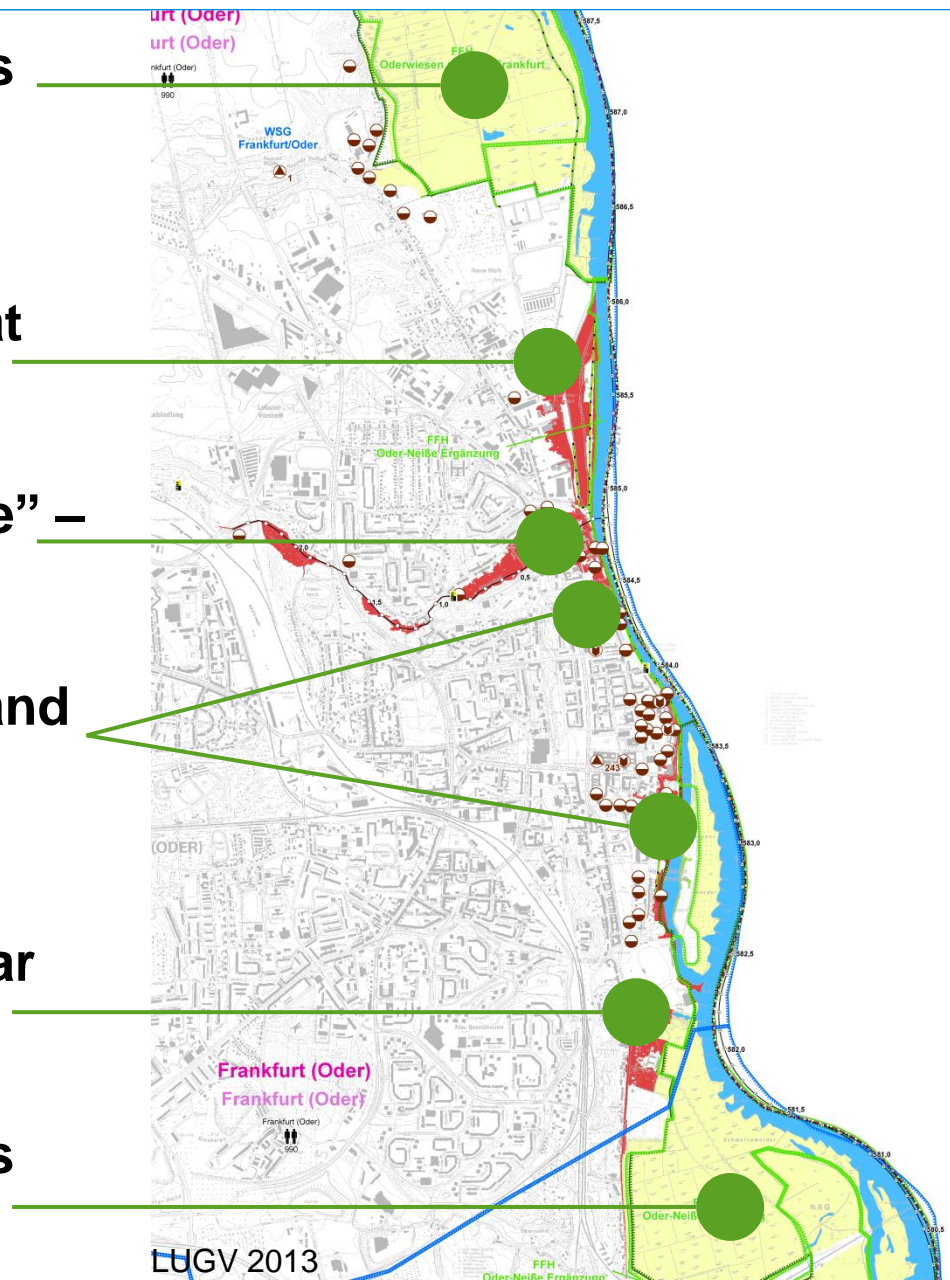


# Current Flood Exposure and Risk

- Flood Hazard and Flood Risk Maps for medium probability (return period  $\geq 100y$ ) of Frankfurt's urban area
- Identified by the Brandenburg State Office of Environment, Health and Consumer Protection (LUGV) according to the EC Floods Directive in 2013
- Transfer to a formal designation of flood plains according to the German Federal Water Act (WHG) is planned for 2014/ 15



- “Oderwiesen” – flood plains (natural retention space)
- Industrial brownfield sites at “Winterhafen”
- Inner-city estuary of “Klinge” – affluent of the Oder
- Inner-city brownfield sites and empty building lots
- Peripheral housing area near “Buschmühle”
- “Oderwiesen” – flood plains (natural retention space)





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LUGV 2013

# Coping with Flood Risk

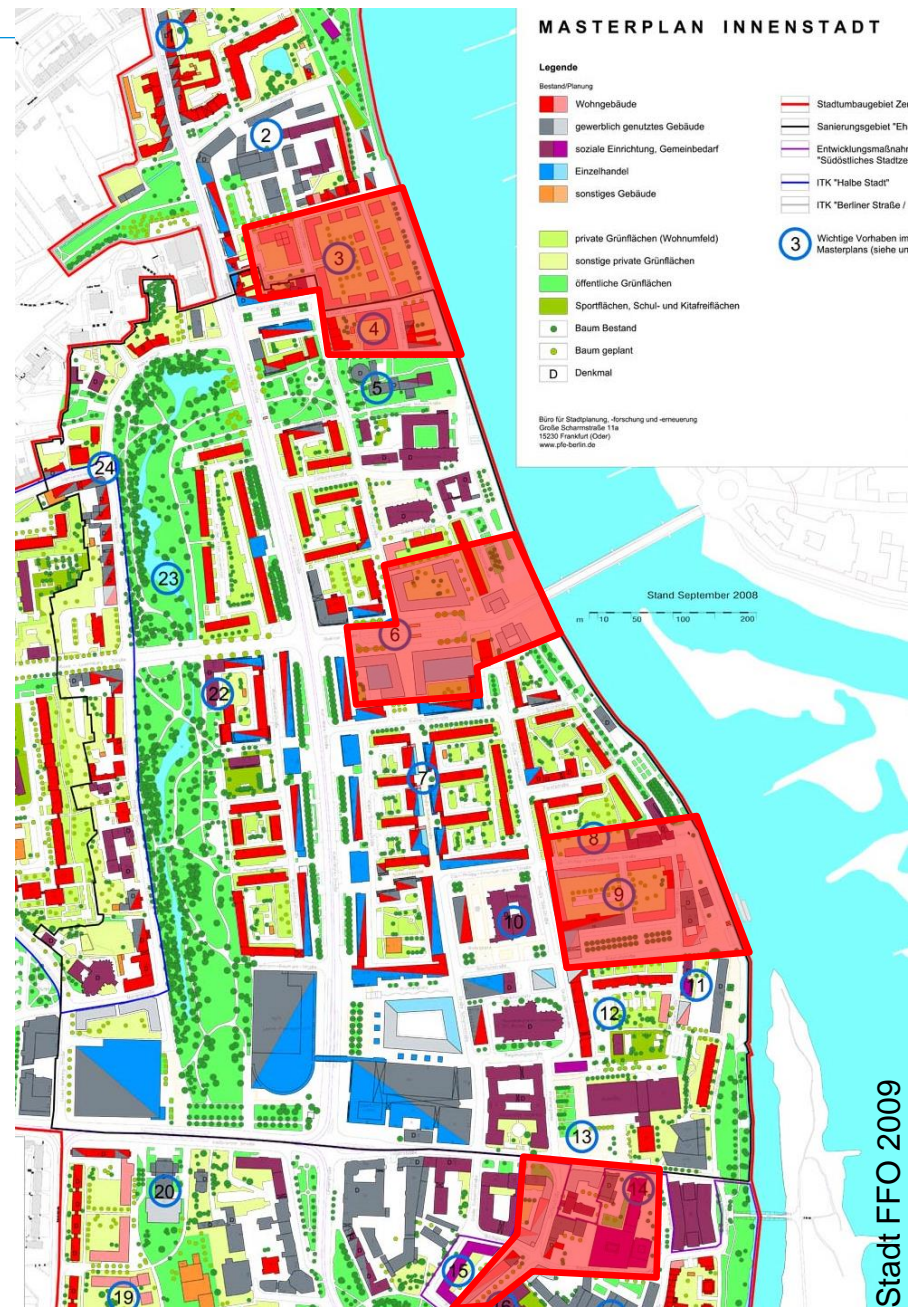
- Option:  
Flood-adapted urban development instead of structural flood protection measures
- Continuous redevelopment and densification of the inner-city despite of existing flood risk
- Option:  
Shift to building-related flood protection instead of embankment of retention space





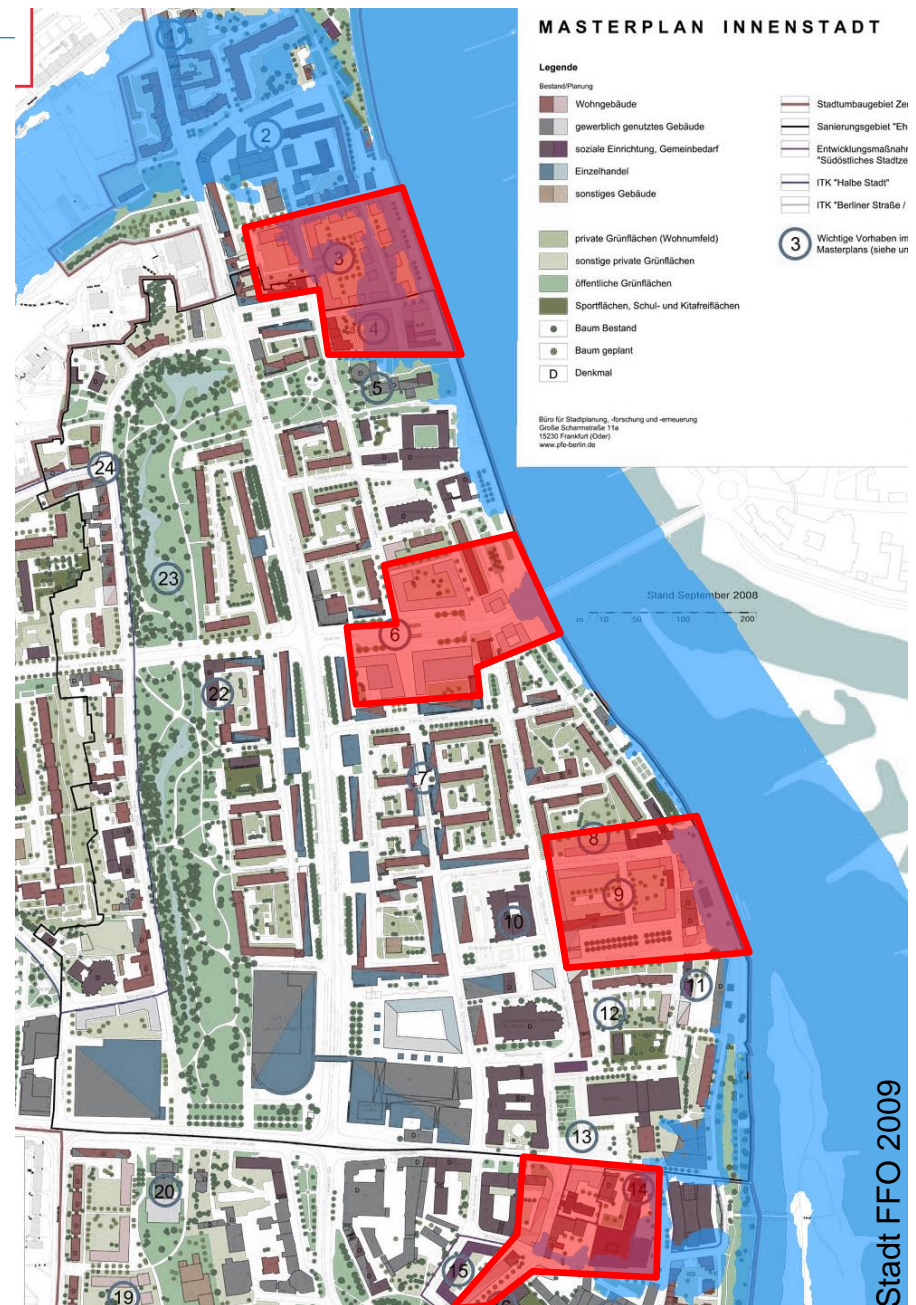
# Inner-City Development

- Inner-city development and reconstruction of the historical urban pattern are still the main urban development objectives of Frankfurt (even with a background of urban decline)
- Due to post-war demolition and deconstruction since the late nineties still potential building sites and lots available



# Inner-City Development

- Potential building sites and lots are partly within flood risk zone of medium probability (HQ 100)
- Designation of formal flood-plains will generally ban any further planning or construction
- Priority to internal urban development rather than external development as general principle for spatial planning at the federal, state and municipal level will be contradicted





# Legal Restrictions on designated Flood-Plains

## Prohibitions\*

- Designation of new development sites on formal flood-plains, except for harbours and shipyards (formal development plan according to German Planning Law BauGB)
- Issue of building licenses to construct or extend buildings on formal flood-plains

**\*according to Federal Water Act (WHG), Article 78**

## Exceptions\*

- no alternatives for human settlement development exist within the administrative area
- (several other needed...)
- already the first condition is not true for Frankfurt
- no or only minor impact on flood retention and loss is compensated for
- does not negatively affect the water level and the run-off
- does not affect the existing flood control measures
- is carried out as flood-adapted

# Compensation for retention space needed

**Future construction and buildings on designated flood-plains within Frankfurt's inner-city need an exception from the restriction of the Federal Water Act (WHG)**

- **New constructions normally will have an impact on natural retention capacity and must therefore be compensated**
- **How?**
- **Assessment of other urban areas within the flood risk zone as potential land to reclaim retention space;  
for example:  
elevated former, unused industrial land, unused garden plots**
- **Challenging within the “own” administrative areas”**



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# Paradigm Shift needed

## Current discussion within the municipality of Frankfurt (Oder):

- **Structural measures like the construction of dykes are not the only solution**
- **Shift to flood-adapted urban development needed**
- **Shift to building-related flood protection (in the responsibility of the owner)**
- **Shift to flood-prevention measures (keeping and reclaiming of retention space)**



**Thank you for your Attention**