University of Innsbruck
Unit of Environmental Engineering

Integrated planning of rehabilitation strategies for sewers

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Guatemala Sinkhole Created by Humans, Not Nature

30-story-deep chasm not a true sinkhole, but a "piping feature."

The sinkhole appeared Sunday in downtown Guatemala City, swallowing a three-story building.

Photograph by Moises Castillo, AP

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National Geographic, June 2010

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What we want …

- renovate aging infrastructure in the most effective way

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- renovate aging infrastructure in the most effective way
- reduce the risk of failures

(photo: Civil Engineering Photos)

What we want …

- renovate aging infrastructure in the most effective way
- reduce the risk of failures
- plan in a prospective way during the service life of new infrastructure (~ 100 years)

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Research project “REHAB”

Integrated planning of rehabilitation strategies for urban infrastructure networks

Funded by Austrian Research Promotion Agency

FFG

Duration: 11/2011 – 12/2013

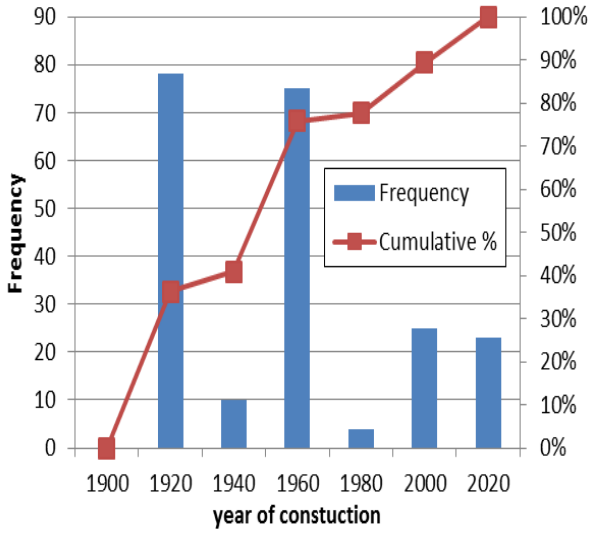
Partners:

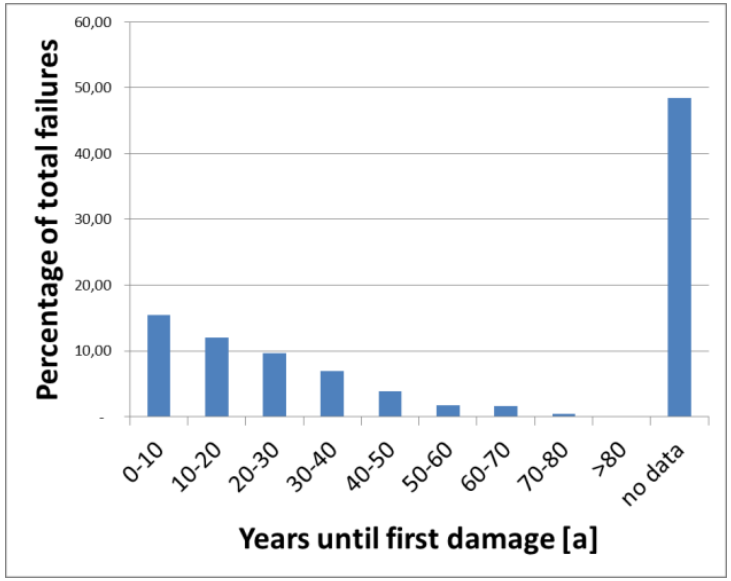
- University of Innsbruck
- hammerer-system-messtechnik
- hydroIT GmbH

Municipalities:

- Innsbruck (Austria)
- Klagenfurt (Austria)
- Herbrechtingen (Germany)

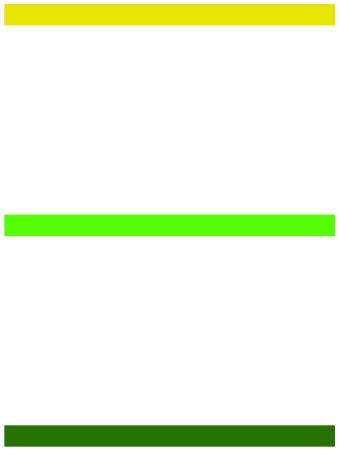
Innsbruck:
35 % (85 km) inspected



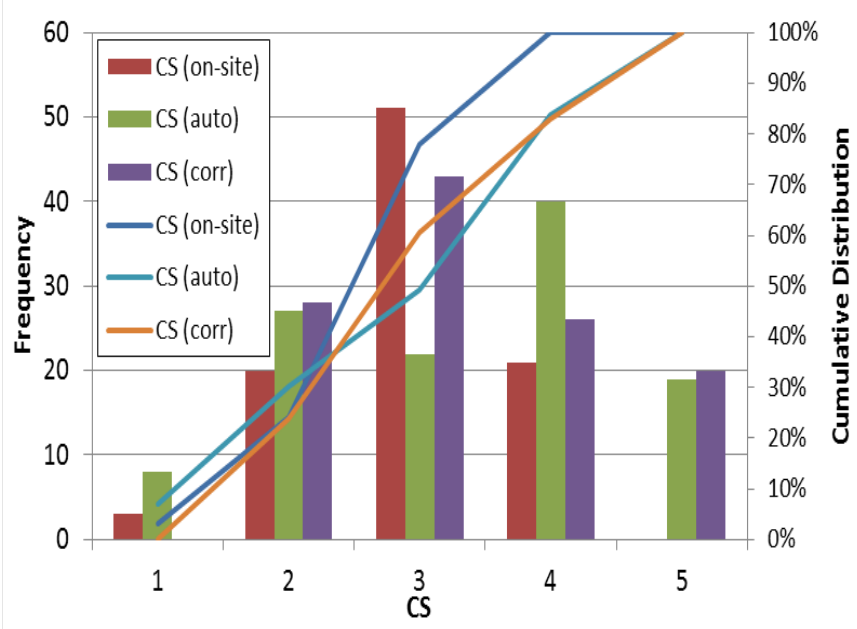


data collection

condition states



condition states

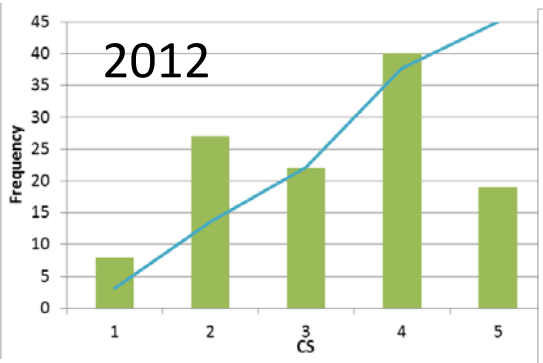


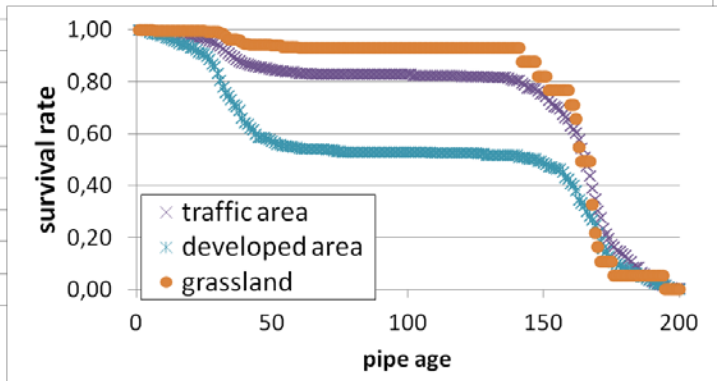
best worst

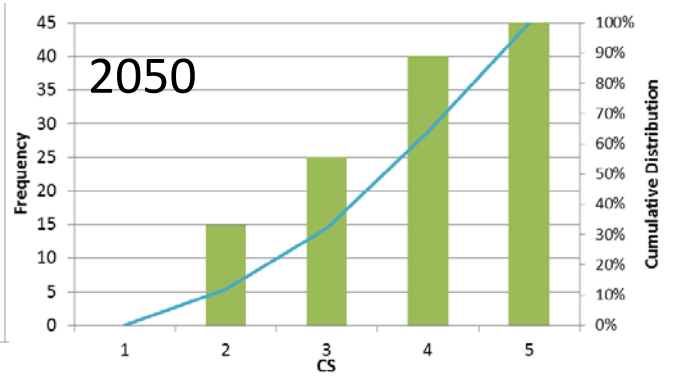
data collection → **Evaluation (damages, CS)**

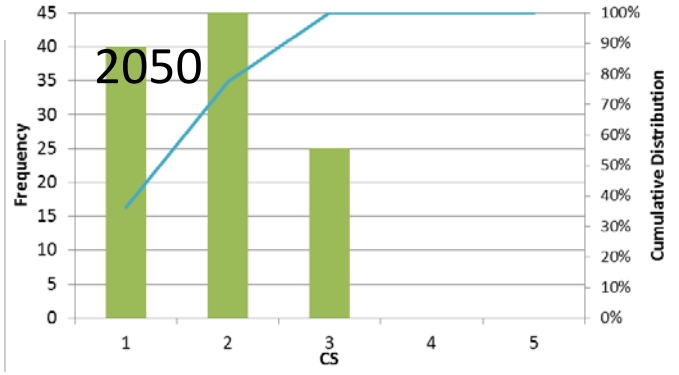
Prediction of condition states

– Cohort Survival model







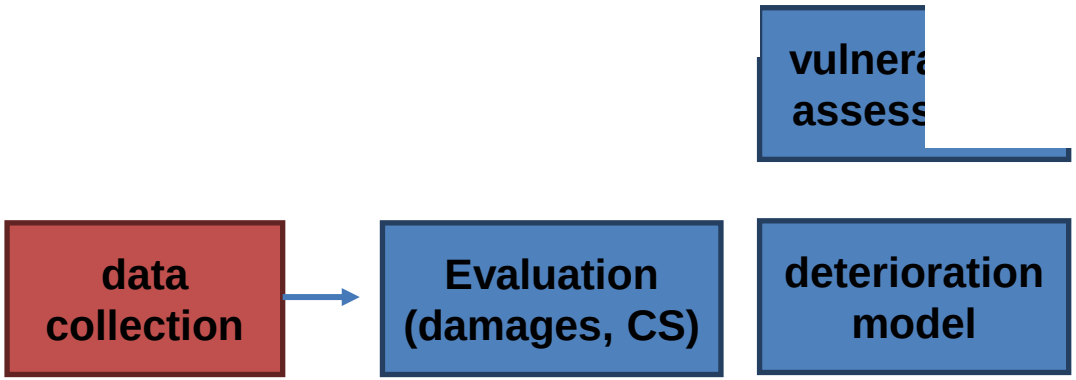


data collection → **Evaluation (damages, CS)** → **deterioration model**

Risk = Probability (condition) x consequence (vulnerability)

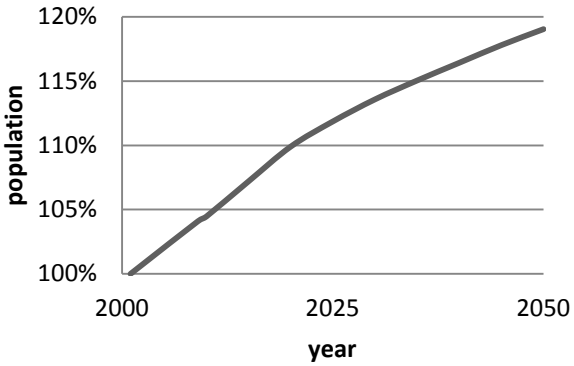
Condition

Vulnerability



Impact of sewer collapse on flooding

Population



Land-use

Climate change

future conditions

vulnerability assessment

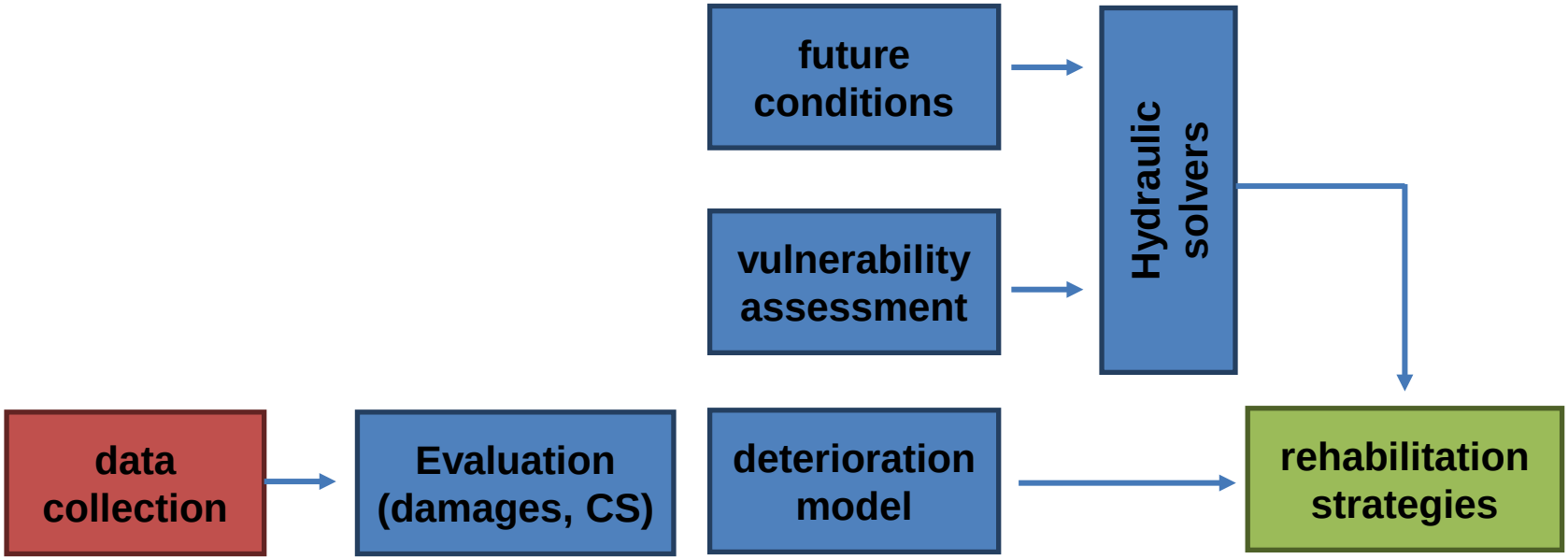
data collection → **Evaluation (damages, CS)**

deterioration model

Reapair

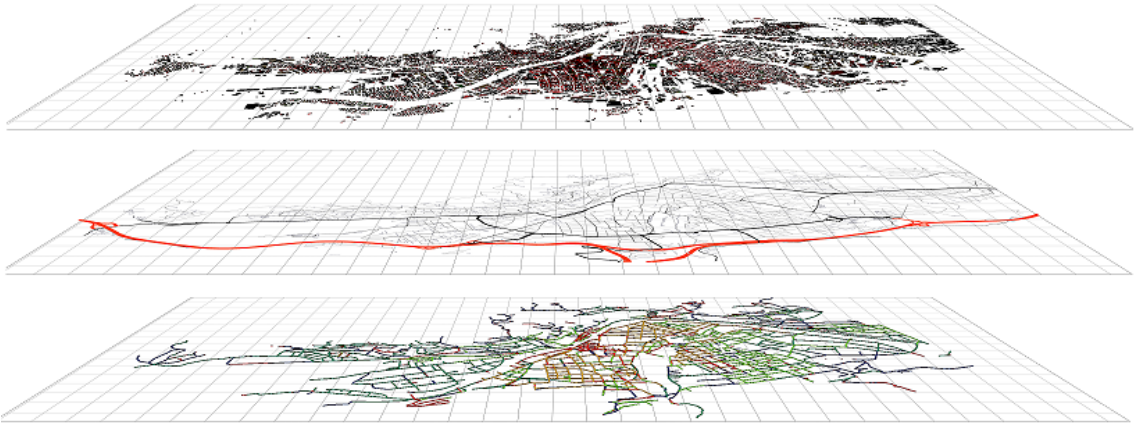
Renovate

Renewal



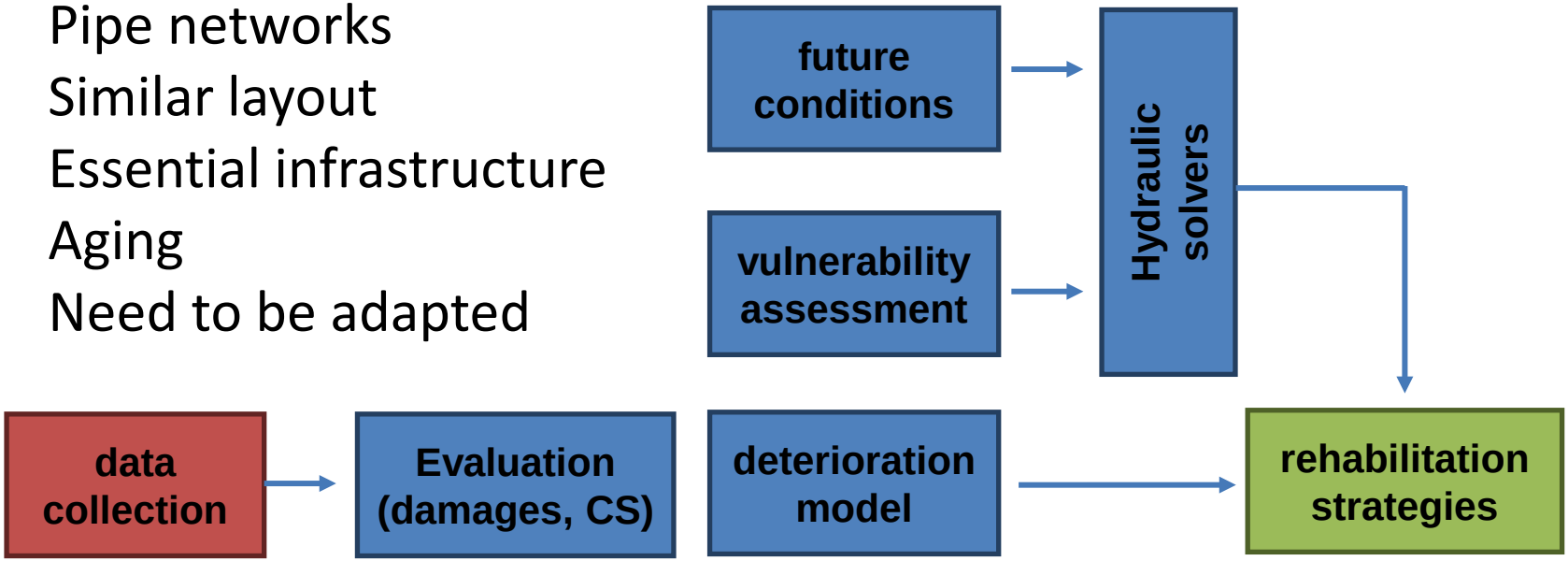
Different pipe networks

- Drainage
- Water distribution
- Gas distribution



Similarities:

- Pipe networks
- Similar layout
- Essential infrastructure
- Aging
- Need to be adapted



Thank you for your attention!

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