XDI SYDNEY PROJECT

BUILDING CLIMATE RESILIENCE ACROSS CRITICAL INFRASTRUCTURE

XDI Sydney is a collaboration between NSW Government and Australian climate tech company XDI Cross Dependency Initiative. It's a large scale, multi-utility climate risk analysis that brings together decision makers from government, water, power, transport, telecoms, defence and emergency management.

The project uses the award winning XDI Platform to quantify extreme weather and climate risk to critical infrastructure in the Greater Sydney area and – importantly – identifies upstream or downstream dependencies that will be impacted by these risks.

Asset level data for over 200,000 assets has been uploaded and classified according to engineering qualities and design specification. The project shows asset owners which third-party risks will affect their own system and, equally, the consequences of their own failure risks to other critical infrastructure.

Risks are quantified both financially and in non-financial KPIs such as the number of customers affected by flood risk.

Results allow asset owners to collaborate on adaptation measures that offset shared risk and allow best allocation of budgets.

Seed funding has been provided by NSW Government Office of Environment and Heritage, with additional funding provided by participating partners.

AIMS OF XDI SYDNEY INCLUDE:

- Quantify the cost of climate change impacts to Sydney's critical infrastructure between now and 2100
- Standardise asset resilience reporting across sectors, including benchmarking, resilience status and targets
- Identify areas of shared risk and opportunities for significant savings via collaborative adaptation
- Improve infrastructure planning and investment decisions based on the results

XDI CROSS DEPENDENCY INITIATIVE

NSW GOVERNMENT Office of Environment & Heritage

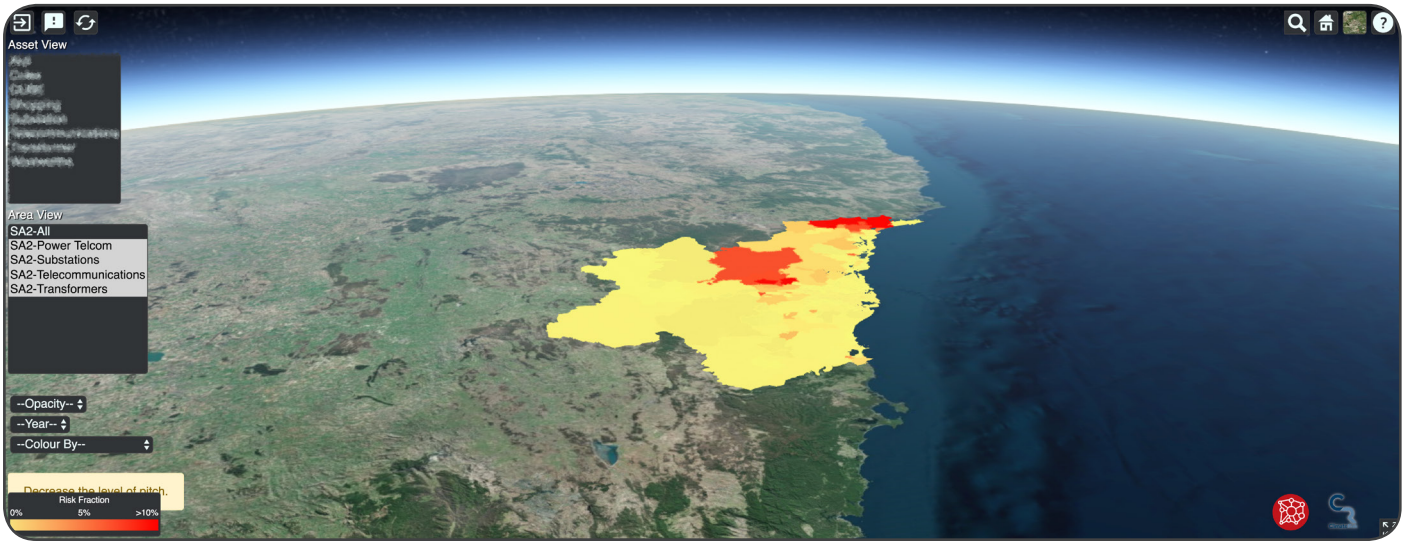
A BETTER TOGETHER AWARD WINNER 2019

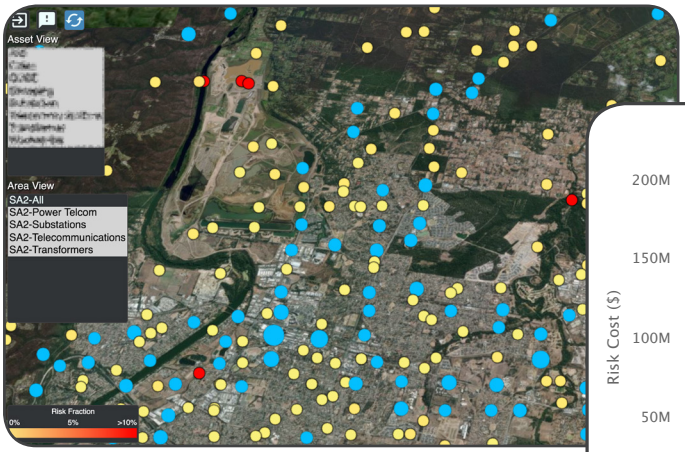
XDI PLATFORM - ALL YOUR CLIMATE IMPACT INFORMATION IN ONE PLACE

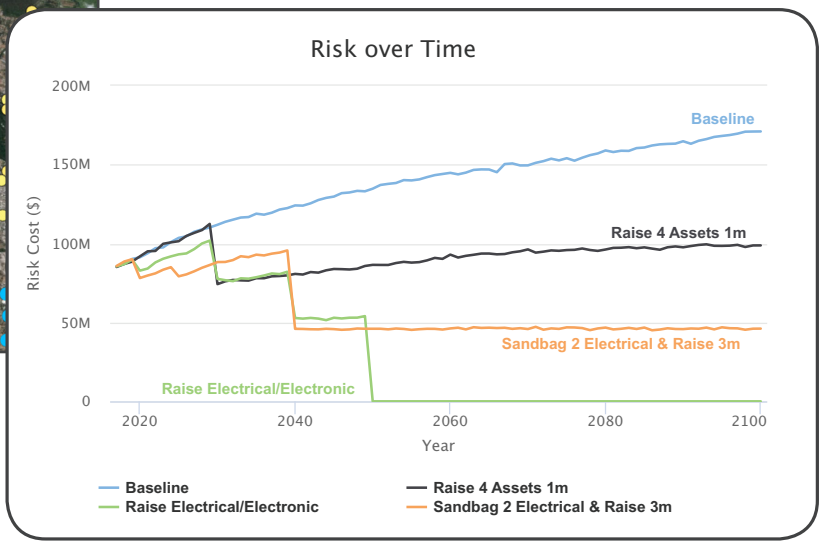
- a powerful online platform that computes and displays climate risk analysis.
- brings together asset data, geospatial hazard maps, climate change impact projections, engineering data and financial analysis.
- provides sophisticated risk identification and cost benefit analysis for adaptation planning across the infrastructure spectrum.
- supports decision making when considering resilience investment options by comparing the costs of investment against saved operational costs and expenses incurred through losses or insurance.

Users access the platform via secure login and work with their asset data in an interactive environment that enables quick identification of risk hot spots. Users are able to delve deeper to obtain asset level information by hazard, engineering element or geographical area.

These tools enable asset owners detailed, on-demand insights into hazards, exposure and vulnerability across a complex, interrelated system that can be readily updated.



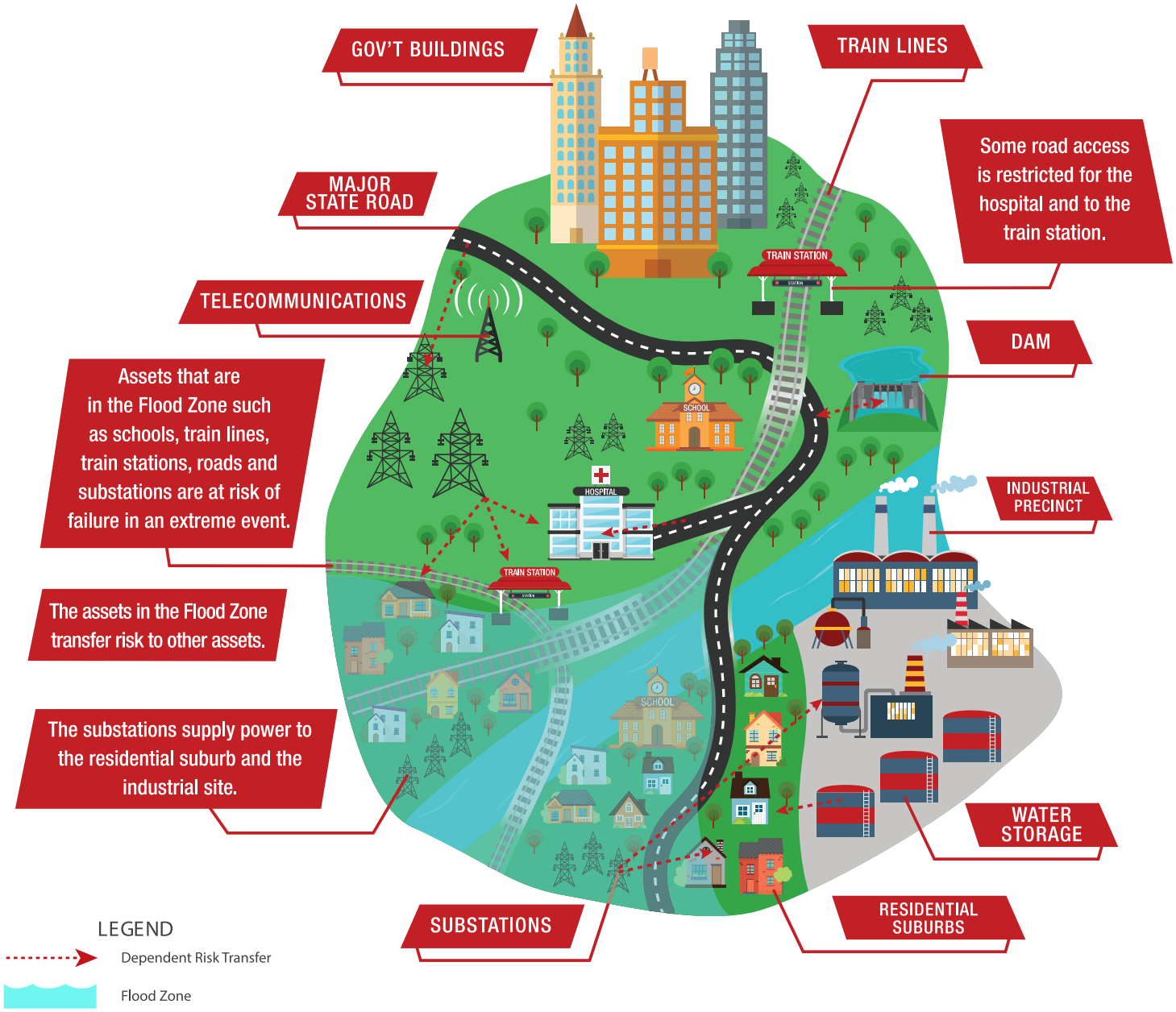




XDI CROSS DEPENDENCY INITIATIVE

CROSS DEPENDENCY AND COLLABORATIVE ADAPTATION

XDI Sydney focuses on the geographical area of Greater Sydney and considers upstream and downstream assets across this area that are essential to the proper functioning of the city, such as water supplies, data lines, access roads and power supply lines.



Securing Data and Sharing Results

Under the legally secure umbrella of the State Government, public and private sector owners of critical infrastructure provide data for cross analysis with other utilities' information. Each organisation retains complete control of their data and the resulting analysis.

All parties make financial contributions to the shared project and extract value through finding partners with shared risks who can collaborate and cost-share on specific adaptation actions.

Software and data hosting are run on high-security cloud servers based in the country of the project to avoid critical infrastructure data crossing international boundaries.

A HYPOTHETICAL EXAMPLE OF COLLABORATIVE ADAPTATION

The XDI team identify that a large number of water assets are dependent upon an electrical sub-station that is prone to flooding, creating potential loss of service to a large number of customers, including the water utility. One way to mitigate this risk is to raise the sub-station floor heights; but that solution will have a marginal Net Present Value compared to managing the risk with insurance. Meanwhile, the local government is considering upgrading storm-water drains in the area to lower the flood risk to residential properties, however the value proposition for them is also marginal.

The XDI Platform can calculate the risk costs to all three organisations (water, power and local government), currently and with future climate change exacerbation. With these figures to hand, managers can determine adaptation measures and timing that mitigate risk most cost effectively. In this example, our model might show that the most financially cost effective solution is to upgrade the drainage in 2020. In collaborative adaptation, the power and electricity company contribute to the cost of the local governments' upgrades to the storm-water drainage. Each organisation makes considerable savings compared to unilaterally adapting their own assets.

PARTICIPATING PARTNERS

Sydney Water

Climate Risk

NSW Government Office of Environment & Heritage

City of Sydney

NSW Government Transport Roads & Maritime Services

NSW Transport for NSW

northern beaches council

nbn Australia's broadband network

Transport Sydney Trains

OBSERVER PARTNERS

Australian Government Department of Defence

NSW Government Justice Office of Emergency Management

NSW Government Treasury

insw Infrastructure New South Wales

XDI Sydney is funded by the NSW Office of Environment and Heritage.