



## **BREAKOUT ROOM 2: XDI**

**ADAPTATION IN ACTION - BUILDING RESILIENCE IN NSW**



# **XDI NSW – live demonstration**

**Jackie Lamb**

Climate Risk

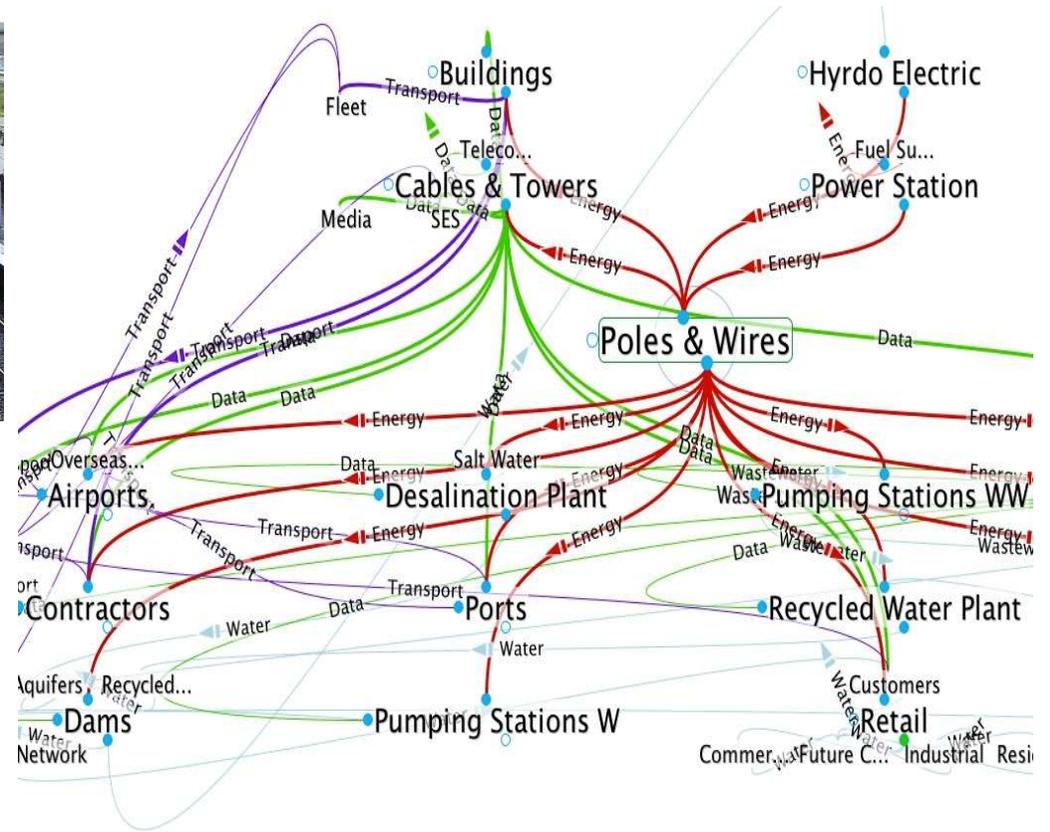
**John de Bruyn**

Project Officer Climate Change Adaptation, DPIE

# Presentation Outline

- XDI Overview
  - Purpose and Context
  - Partners and History
  - Platform and data sources
  - Outputs and reporting
- XDI Sydney to XDI NSW
  - Collaborative Adaptation case studies using partners data
  - Project expansion to whole of NSW using public data
- Live demonstration of XDI NSW platform

# Infrastructure = Interdependency



# Embedding climate change adaptation



future  
transport 2056

**FUTURE  
TRANSPORT  
STRATEGY  
2056**

**Building  
Momentum**

State Infrastructure Strategy 2018-2038

February 2018

we are **in**NSW  
Infrastructure  
New South Wales



GREATER SYDNEY REGION PLAN

**A Metropolis  
of Three Cities**  
– connecting people

Justice  
Office of  
Emergency Management

2017 State Level  
Emergency Risk Assessment  
**Executive Summary**

July 2017



NSW  
GOVERNMENT

NSW Critical Infrastructure  
Resilience Strategy

**Partner, Prepare, Provide**

NSW Department of Justice | Office of Emergency Management



**ADAPTNSW: Adaptation in Action – Building Resilience in NSW**

# XDI Sydney - Foundation Partners



## XDI Sydney - Observers



ADAPTNSW: Adaptation in Action – Building Resilience in NSW

# XDI Sydney - Better Together Award 2019



# What is XDI ?



**AdaptWater™**  
A climate change adaptation tool for the urban water industry

AdaptWater™ will allow climate change and extreme weather events and compare adaptation options.

## Overview of project

AdaptWater™ is an online climate change adaptation tool that quantifies the risk associated with various scenarios and analyses of proposed adaptation options.

A range of scenarios can be developed to assess the impact of various climate change hazards such as sea level rise, drought, and extreme weather events. The tool is backed up by a robust data set to determine the most cost effective adaptation options.

- measure the impact of climate change on assets
- predict the probability of extreme weather events by climate change
- calculate the risk to the assets
- compare adaptation measures and allow prioritisation
- present outputs in a visual format for asset managers, financial controllers and decision makers



## Adapting roads to climate change

**COUNCIL NAME**  
Manly Council  
**WEB ADDRESS**  
[manly.nsw.gov.au](http://manly.nsw.gov.au)  
**SIZE**  
14.4 square kilometres  
**POPULATION**  
44,232

### Overview

The AdaptRoads pilot project builds resilience to road infrastructure by developing a business case for adaptation. The tool uses road asset data and based essential data both from Manly Council and the Office of Environment & Heritage.



### Background

NSW local government assets are valued at over \$100 billion and are exposed to a range of climate change risks, including extreme weather events, sea level rise and drought.

Road infrastructure is particularly vulnerable to extreme weather events, such as flooding and landslides, which can cause significant disruption to the transport network.



Build the business case for adaptation

### Cross Dependency Initiative – XDI Sydney

#### What is the XDI Sydney project?

Critical infrastructure is highly interdependent, which means the ability to contain climate related disruption to services and assure resilience is quite limited without a system-wide view. The NSW Office of Environment and Heritage (OEH) is partnering with Sydney Water and Climate Risk to develop the AdaptWater tool to co-develop the Cross Dependency Initiative or XDI Sydney. The project will identify areas where there are critical extreme weather and climate change risks to assets, and importantly the dependencies between different types of infrastructure.

Building on the development of the AdaptWater tool by Australian water utilities and its expansion to AdaptRoads by Manly Council, the project will develop an AdaptInfrastructure tool that will be able to identify cross-dependent climate change impacts in water, electricity, transport, telecommunications, and built environment infrastructures. It will use GIS spatial data for weather, engineering and financial data to analyse large numbers of utility assets for risks and the effect of co-dependencies.

XDI Sydney will initially run as a pilot for 3 years within the geographical area of Metropolitan Sydney – including upstream and downstream assets that are essential to the proper functioning of the city – and will be readily expandable to NSW and nationally.

AdaptInfrastructure will provide computationally detailed insights into hazards, exposure and vulnerability across a complex system, which can be constantly updated as assets are added or removed. In this way, asset owners can see which risks to third party infrastructure assets will affect



**ADAPTNSW: Adaptation in Action – Building Resilience in NSW**

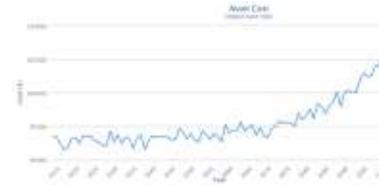
# XDI analysis



Climate Risk Engines

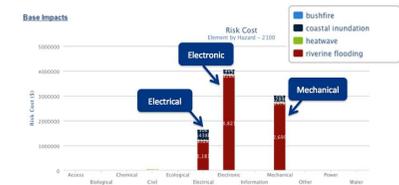


Risk Cost and Asset Failure Projections



Heat Mapping of Risk of portfolios

Vulnerability Diagnostics



Adaptation Planning, Cost Benefit Analysis



# XDI data

## Asset Data

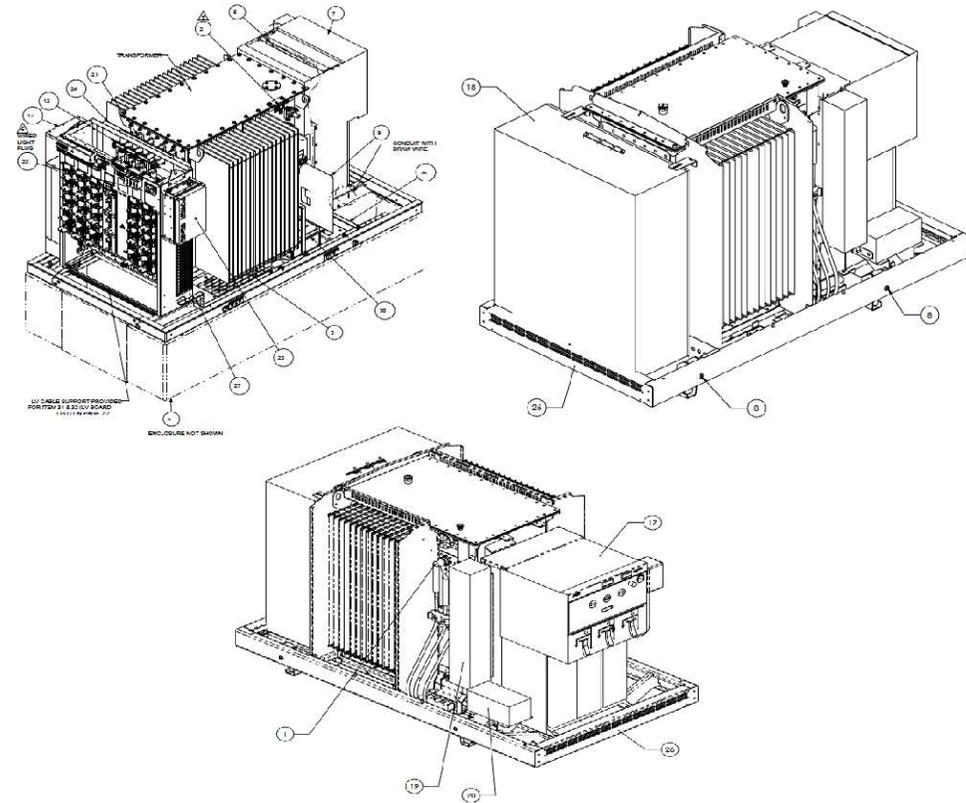
- Location, Materials, Engineering specs
- Elements – electrical, mechanical, civil etc
- Archetypes and specific data used

## Climate impacts, projections & hazards data

- coastal inundation
- riverine flooding
- extreme winds
- bushfire
- heat
- soil movement

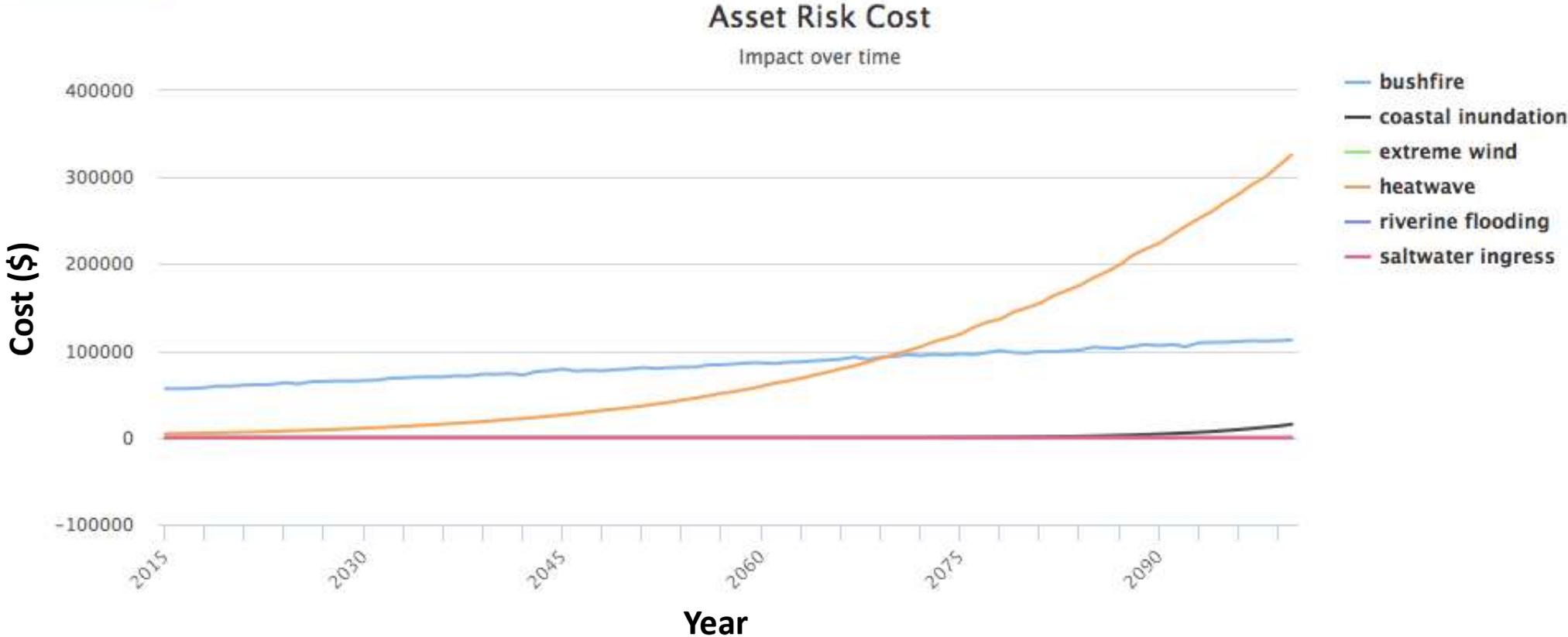
## Financial data

## Usage/customer service data



# Asset risk cost

## Base Impacts



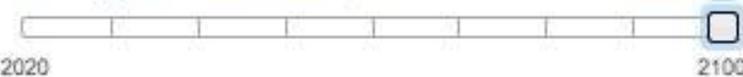
# Adaptation Options



Chart years



Summary year for accumulated impacts



Adaptation option name	Select preferred	NPV all costs	PV Asset risk cost	# Failure Events	Health Impacts	Customer disruptions	Edit
base_unadapted		\$10,141,337	\$9,678,032	394	0	0	
Adaptation Option		\$9,233,436	\$8,753,583	212	0	0	  

# Application of XDI

**Asset management** – inform business cases, prioritise funding for upgrade and/or replacement

**Risk management** - inform risk framework/register

**Strategic development** – inform site selection, technical designs and specifications, procurement and planning consent conditions

**Emergency management** – inform emergency planning and risk assessments, including managing events and large public gatherings

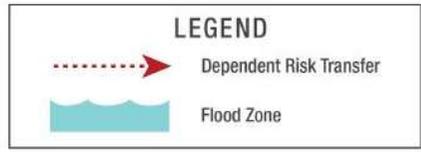
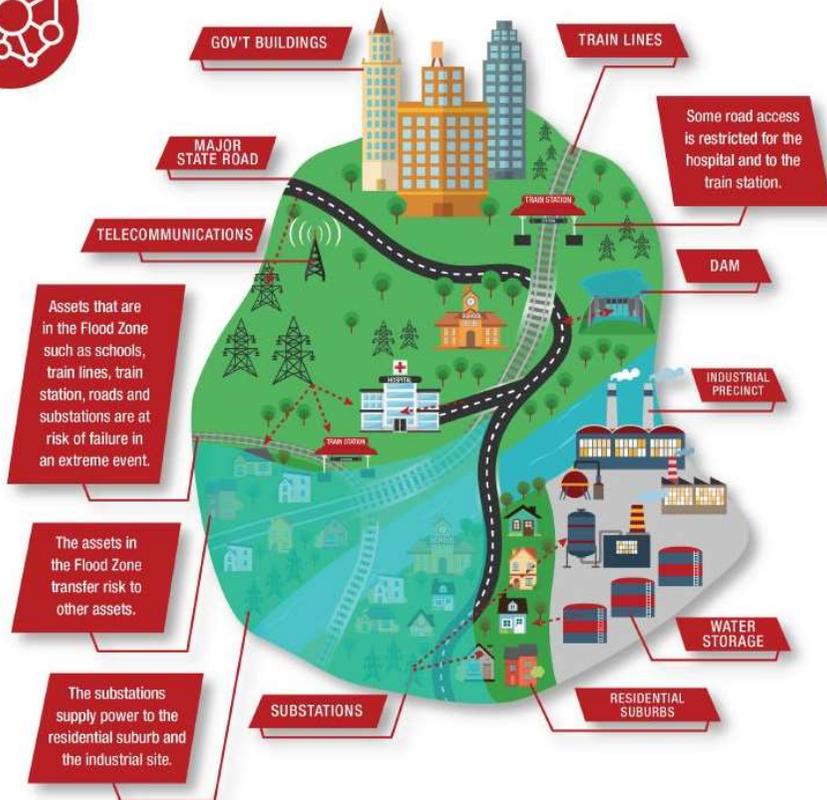
**Collaborative Adaptation**



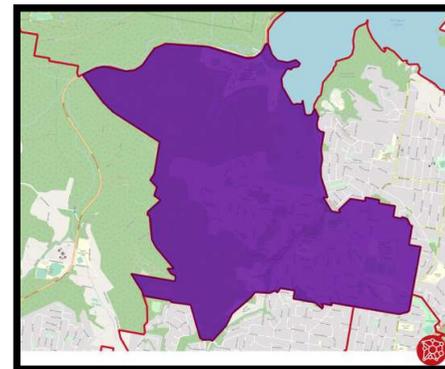
# Testing collaborative adaptation



## AN EXAMPLE OF DEPENDENT RISK TRANSFER



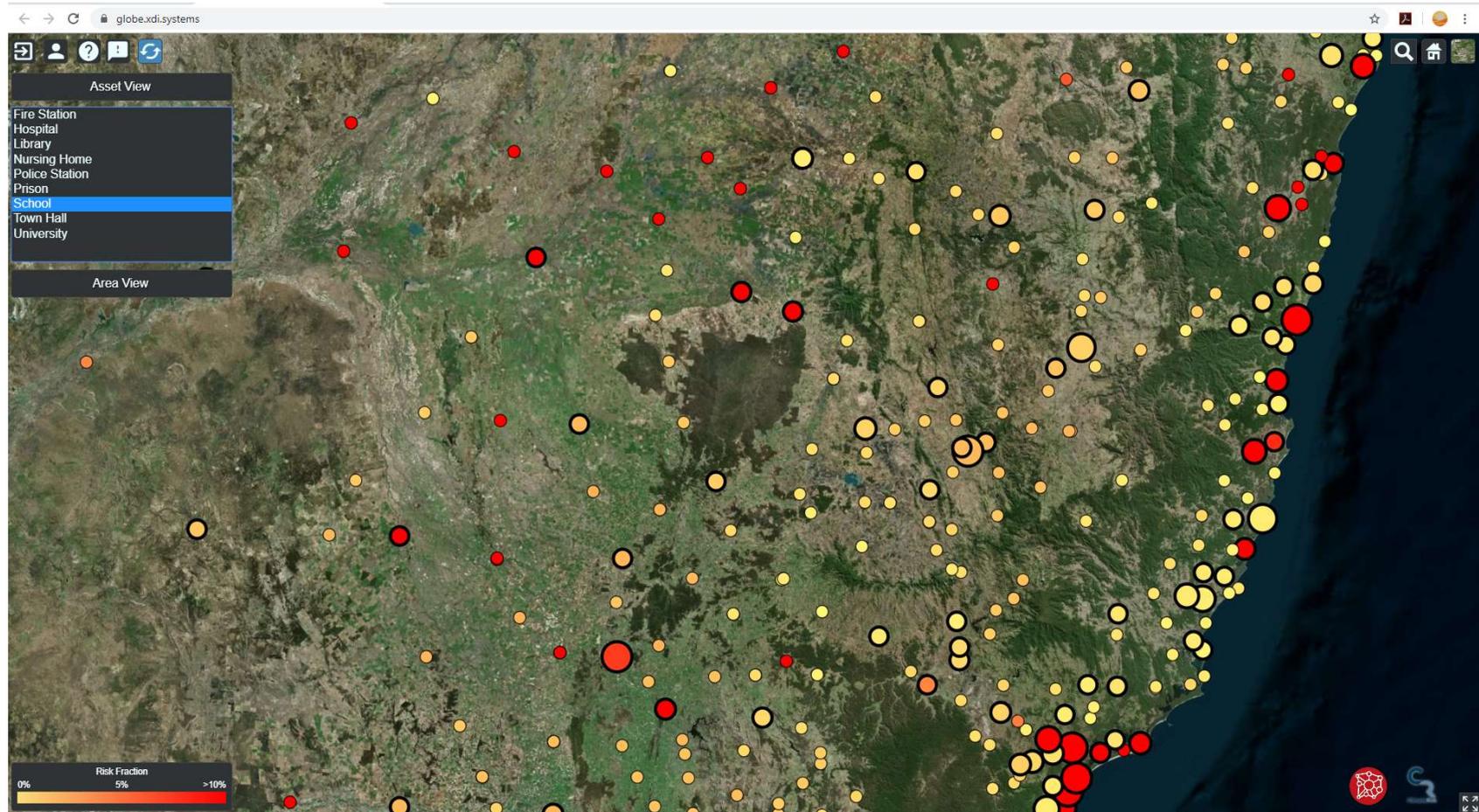
Town Hall



Cromer/  
Narrabeen



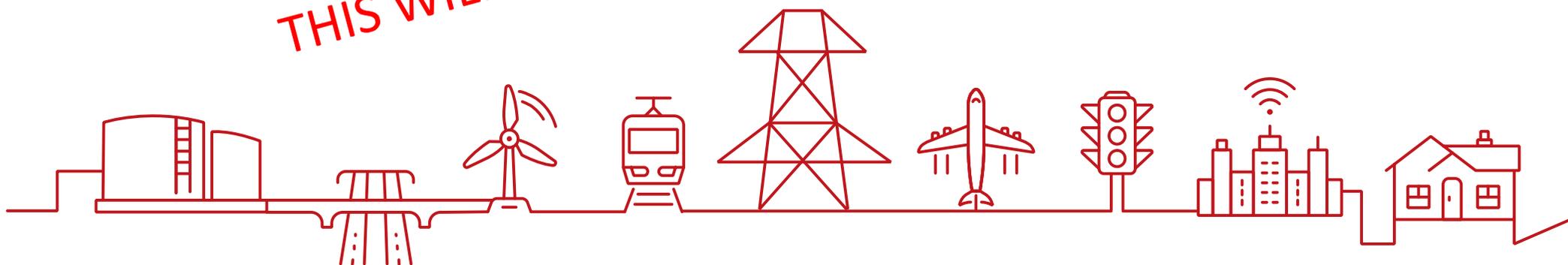
# XDI NSW – live demonstration



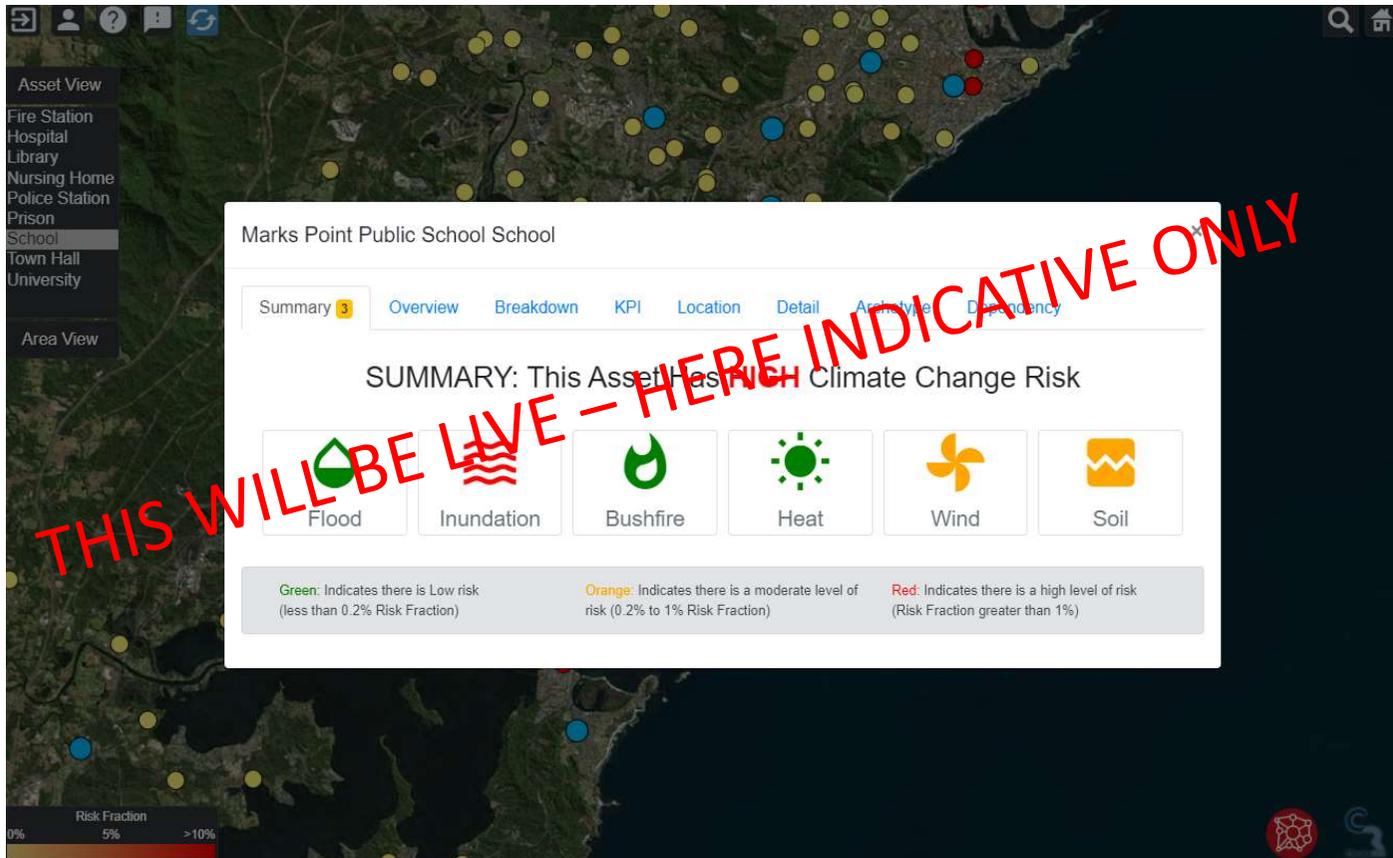
<https://xdi.systems/our-products/xdi-globe/>

hand to Jackie to present live demonstration of schools

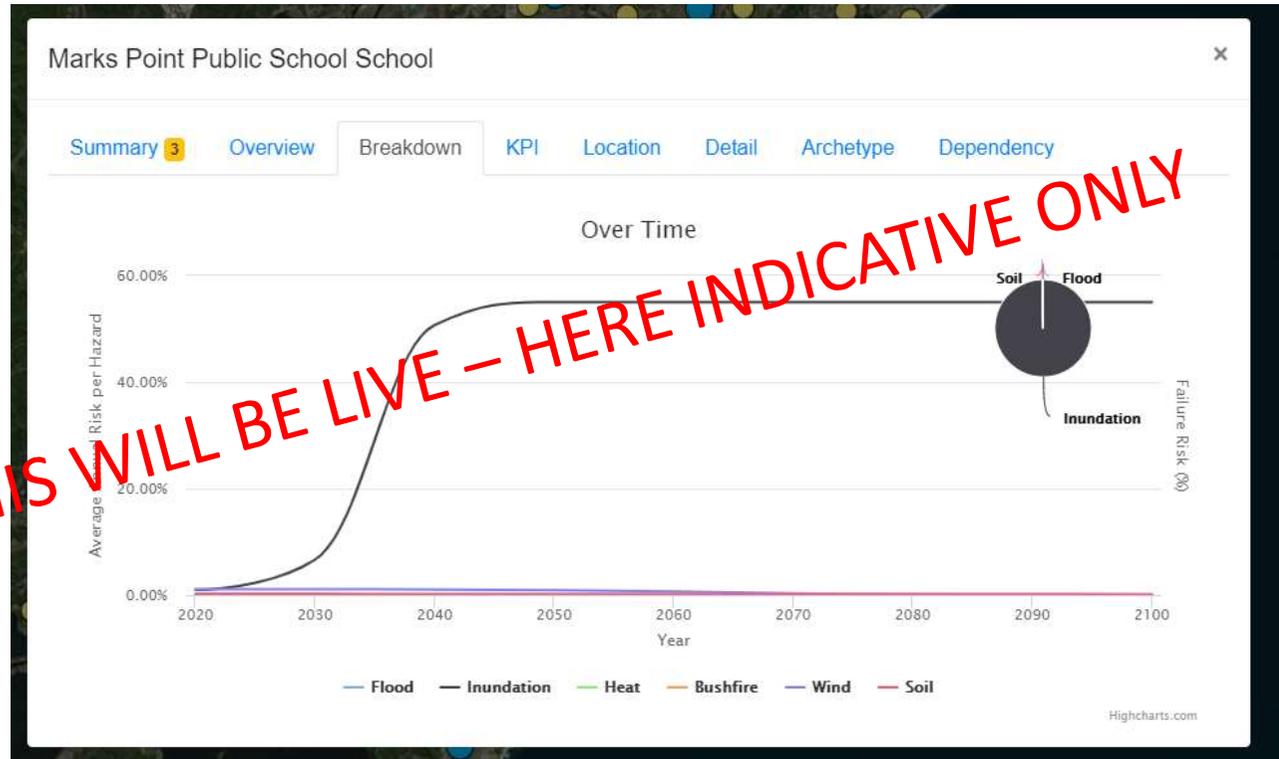
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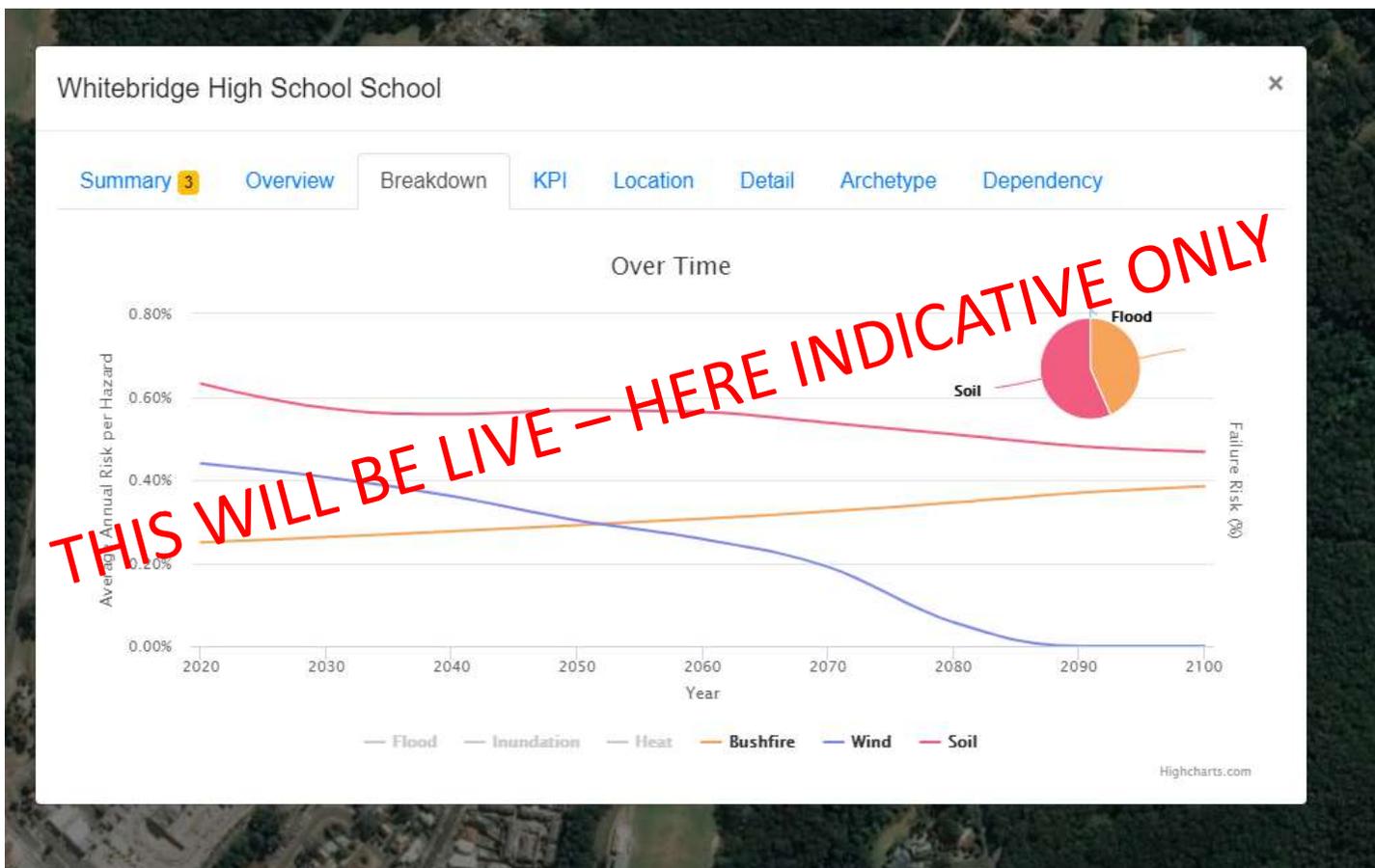






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## Questions ?

### Are you interested in using XDI NSW?

- In 2020 we will be rolling out access to the XDI NSW online platform
- Please register your interest by sending an email to

[adapt.NSW@environment.nsw.gov.au](mailto:adapt.NSW@environment.nsw.gov.au)



# Thank you

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