



HIRAM

Highways Infrastructure Resilience Assessment Modeling Tool

South West Transport Climate Change
Adaptation Task and Finish Group



HIRAM





Wilson Pym May



HIRAM





What is **HIRAM**

A Web based tool

Aimed at Highways Managers

Network Level

Weather Resilience Focused

Economic focus

Community Consideration



HIRAM





Why Make a Tool

The need for Resilience

Highways need to support the economy.

Transport corridors need to be resilient along their length.

We aren't sure of the risks or costs on a network level.

The case for funding.



What are the Benefits

You understand

what and where your risks are.
the impacts on your communities.
financial impact on your local businesses

You can

plan your resilience adaptation.
evidence the need for finance.
manage your highway infrastructure.

How **HIRAM** helps

What part of the network needs to be resilient?

What and where are the risks today?

What and Where are the risks in the future?

How will the risks affect the economy, communities and the Authority?

How can resilience be achieved where the risks exist?

What will resilience cost to put in and to maintain?

What is the Economic benefit of the resilience measures?

How can resilience measures be funded?

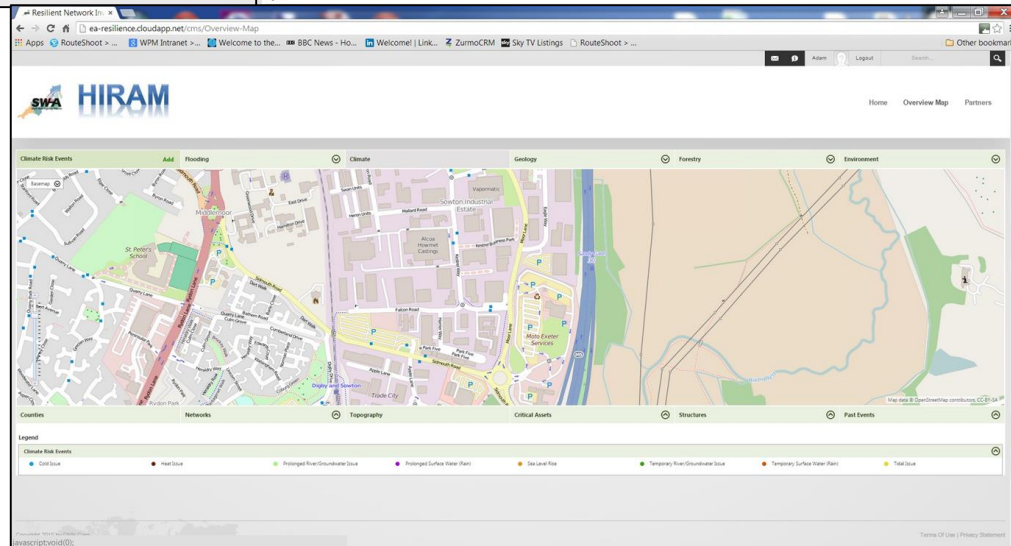
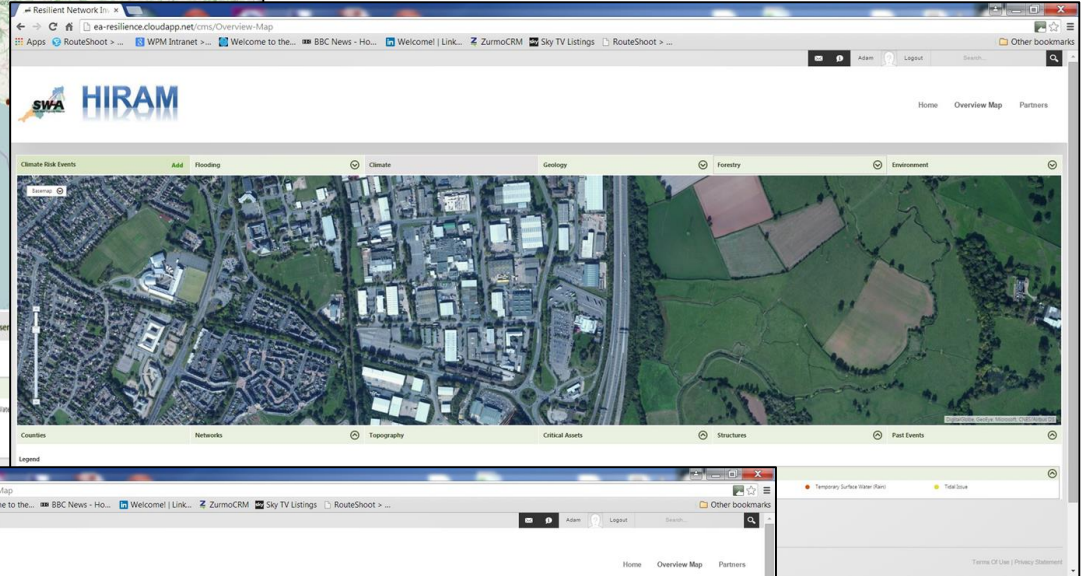
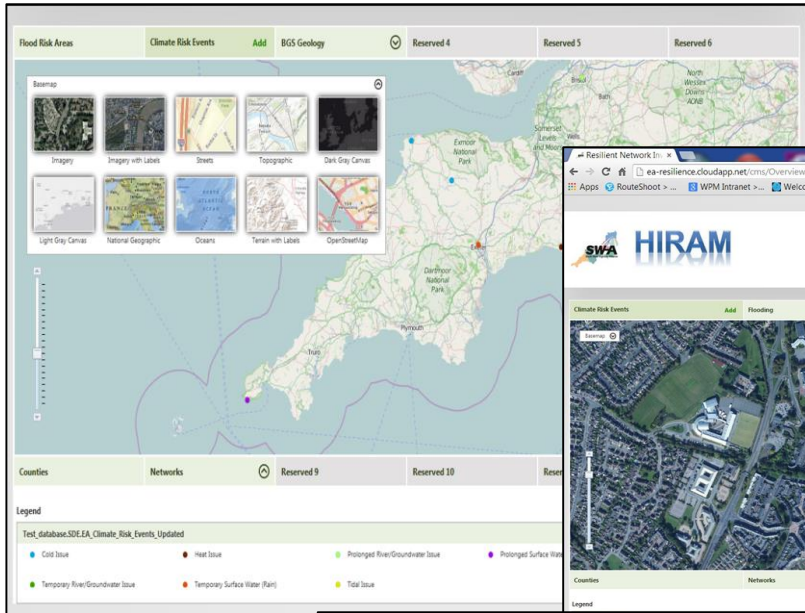
How do I use HIRAM?

Straight forward;

Gather the Engineers,
Use the mapping and data layers,
Drop a pin on the map,
Complete the event form,
HIRAM does the analysis.
Run the Reports.



Mapping Layers



Data Layers

The screenshot displays the HIRAM Resilient Network Overview Map interface. The browser address bar shows the URL `ea-resilience.cloudapp.net/cms/Overview-Map`. The page header includes the SWA logo, the HIRAM logo, and navigation links for Home, Overview Map, Partners, and Reports. A user profile for Adam is visible in the top right corner.

The main content area features a map with several data layers overlaid. The layers are organized into a grid with expandable sections:

- Climate Risk Events:** Includes a sub-section for **Flooding**.
- Climate:** Lists several metrics:
 - Change in Summer Mean Max Temp (°C)
 - Change in Winter Mean Min Temp (°C)
 - Change in Wettest Days of Summer (%)
 - Change in Wettest Days of Winter (%)
 - Change in the Warmest Day of Summer (°C)
 - Change in Annual Mean Precipitation (%)
- Geology:** A layer showing geological features.
- Forestry:** A layer showing forested areas.
- Environment:** A layer showing environmental data.

At the bottom of the map area, there are tabs for **Counties**, **Network**, **Topography**, **Critical Assets**, **Local Assets**, and **Past Events**. A legend at the bottom left identifies the **Resilient Network** with a red line symbol.

Simple Input Form

The screenshot shows a web browser window displaying the HIRAM application. The browser address bar shows 'ea-resilience.cloudapp.net/cms/Overview-Map'. The application header includes the SWA logo and the text 'HIRAM'. Navigation links for 'Home', 'Overview Map', 'Partners', and 'Reports' are visible. Below the header, there are tabs for 'Climate Risk Events', 'Add', 'Flooding', 'Climate', 'Geology', 'Forestry', and 'Environment'. A map is displayed with a 'Basemap' overlay. A 'New feature added - edit details' form is open over the map, containing the following fields:

Authority	Devon
Description	River Exe Cowick Street
Road Number 1	B3212
Road Number 2 (optional)	
Road Number 3 (optional)	
Major Asset Type Affected	Carriageway
Urban or Rural	Urban
Weather Event	Temporary Surface Water
Event Type	Temporary Surface Water (Rain)
Average No of Events Per Year	
Average Duration of Each Event	
Current Serviceability of Asset	
Current Asset Maintenance Regime	

At the bottom of the application, there are tabs for 'Counties', 'Network', 'Topography', 'Critical Assets', 'Local Assets', and 'Past Events'. A legend is visible at the bottom left, showing 'Resilient Network' with a red line icon.



What does HIRAM Analyse?

Rule based formulae

- Risk Scores
- Carbon and Greenhouse Gases
- Journey time cost increases
- Cost of impact over time
- Investment Payback Period

What can we do with it?

Range of reports
 Business Cases
 Committee Reports
 Prioritise Investment
 Seek Funding
 Collaborate

South Gloucestershire Council **HIRAM** **SWA**

SITE REPORT FOR: Major bridge damage(Frampton Cotterell)

Site Details:

Climate Event ID:	3	Major Asset Type:	Bridge or Tunnel
Route Road No:	A234	Urban or Rural:	Urban
Primary Event:	Temporary Surface Water (Flood)	Event Type:	Predicted Future One-Off Event
Authority:	South Gloucestershire	Recorded By:	Jon Mordue

Event Duration Details:

Ax. Events/Year:	1	Ax. Duration:	3 months to 6 months
			Duration Factor: 105.00

Maintenance Details:

Current Asset Serviceability:	Fair	
Current Maintenance Regime:	Reactive and Cyclic Serviceability	
		Asset Risk Score: 6

Access Details:

Is This The Only Route Into or Out Of A Community?:	No	
Access - Number of Domestic Properties Directly Affected:	10 to 30	
Access - Number of Domestic Small Businesses Directly Affected:	1 to 10	
Access - Number of Domestic Medium Businesses Directly Affected:	0	
Access - Number of Domestic Large Businesses Directly Affected:	0	
		Access Risk Score: 6

SOUTH GLOUCESTERSHIRE COUNCIL
CLIMATE EVENT SCHEMES - RANKING DETAILS

EVENT ID	EVENT NAME	ASSET	ACCESS	SEVERANCE	CASCADE	HEALTH & ENV	TRAFFIC	SUM	DURATION	RANKING
2	Bank slip road in cutting medium route(Beaminter)	10	3	6	10	4	15	48	200.00	8,600.00
9	rural road underwater for 3 months	10	40	0	0	0	5	55	105.00	5,775.00
3	Major bridge damage(Frampton Cotterell)	6	6	21	6	5	5	49	105.00	5,145.00
7	Swinford River flooding	8	100	6	6	3	30	153	26.00	3,978.00
5	Sea Flooding Severnside seawall overtopping	6	120	1	1	4	50	182	13.50	2,457.00
10	summer road melling A352 cant access elec station	8	60	10	5	0	3	86	13.00	1,118.00
4	Regular route flooding (Perenpit Lane)	10	7	1	1	5	5	29	13.50	391.50
6	Hayes Way Flooding of dual section R/about	3	13	1	6	5	2	30	13.00	390.00
1	Major route linking towns(Winterbourne Abbas B road)	1	4	6	1	2	30	44	4.00	178.00
8	A432/A48 Cross Hands junction flooding	8	4	0	1	2	3	18	9.00	162.00

HIRAM Users

26 Active Authorities

15 SWHA at various stages of use

11 EHA just signed up and bought in

Using the outputs.

Asset Maintenance Programming

Business Cases

Stakeholder Engagement

DfT Highways Maintenance Incentive
Fund

SWHA Regional Resilience Risk
Report

Developing HIRAM

Off Resilient Network Risks

Intelligent drill down of data layers

Route Based Reporting

User group being set up

Further sharing with new authorities



HIRAM

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HIRAM

