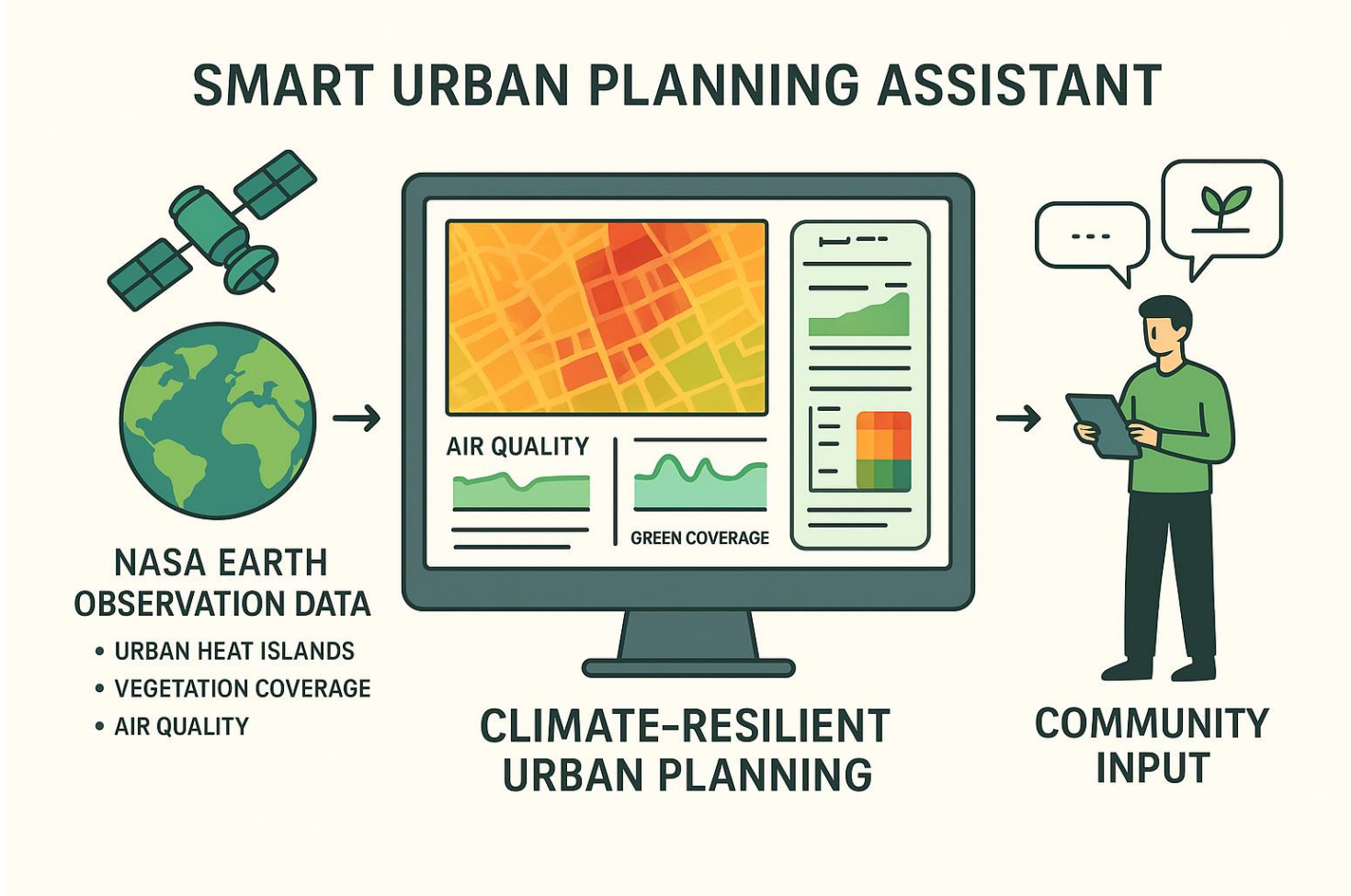
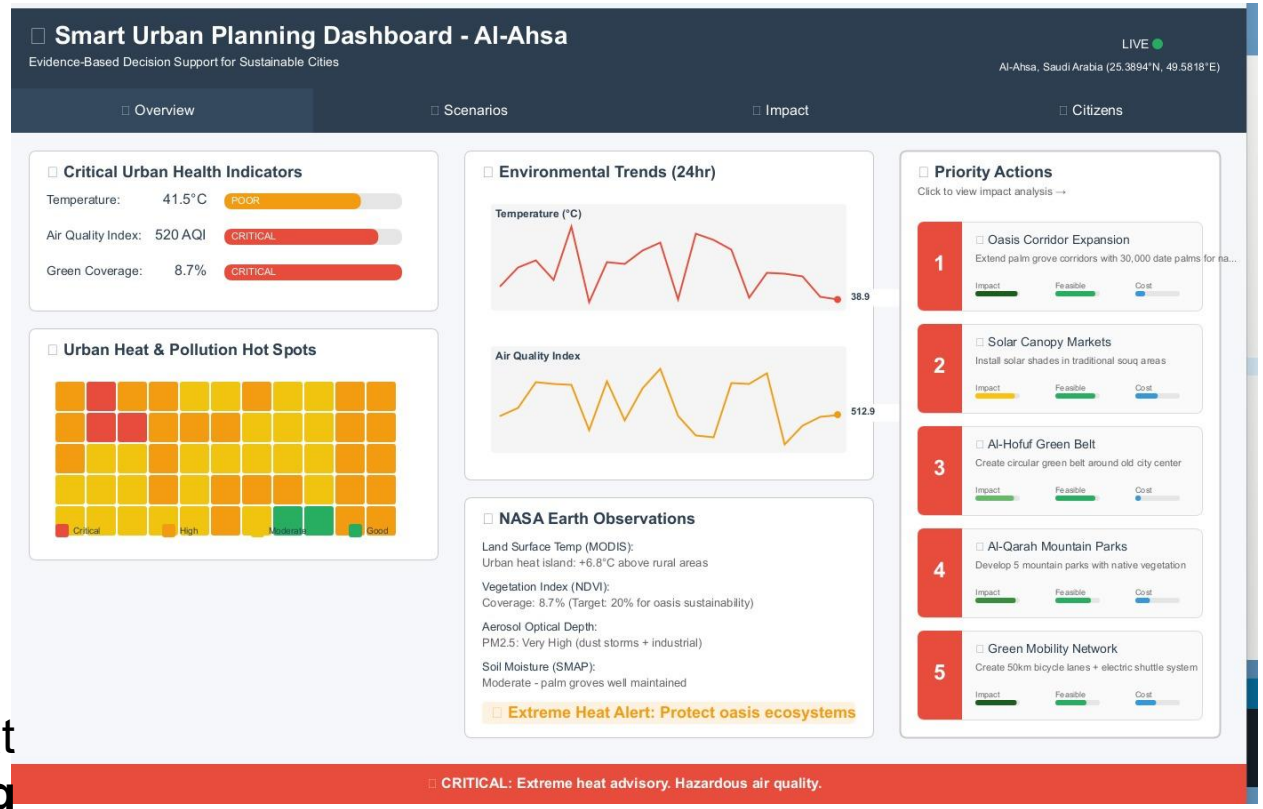
Smart Urban Planning Assistant Simulator



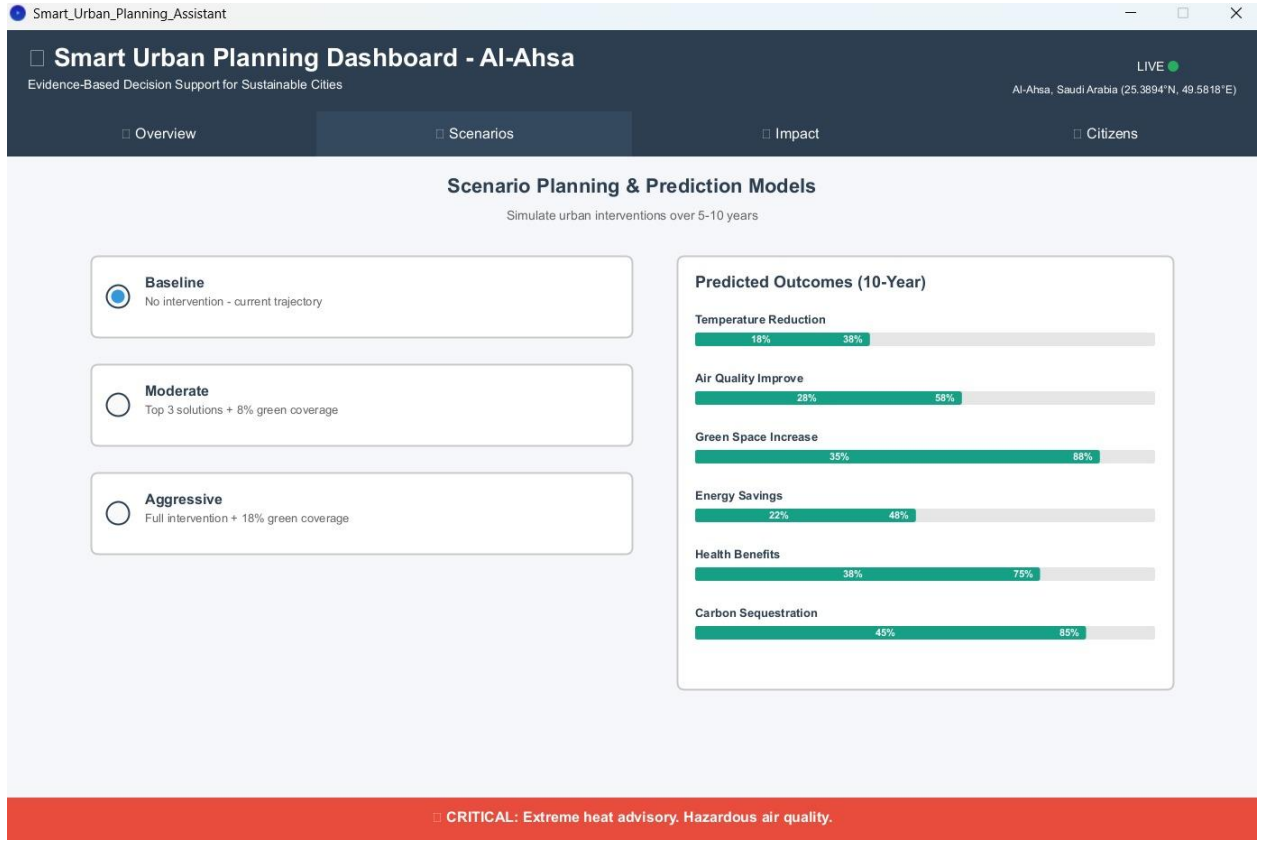
- By Muna Salah

Our project is a **smart dashboard** that connects **NASA satellite data** with **ground sensors** to analyze conditions in **Al-Ahsa City**.
We identified the main problems: **high temperatures**, **severe air pollution**, and **a lack of green spaces**.
Using NASA data such as **MODIS** and **SMAP**, we proved the existence of a **heat island** where temperatures are **6.5°C higher** than surrounding areas.
We presented a **map highlighting the most affected neighborhoods**, helping urban planners know **where intervention is most needed**.
The system proposes **smart solutions**, such as **expanding oasis corridors**, with an evaluation of **impact, cost, and feasibility**.
Finally, **real-time alerts** like **CRITICAL** demonstrate that the system is **practical for saving lives and protecting public health**.
In short: our project turns NASA data into a clear plan **— where to act, what to do, and why it will succeed.**

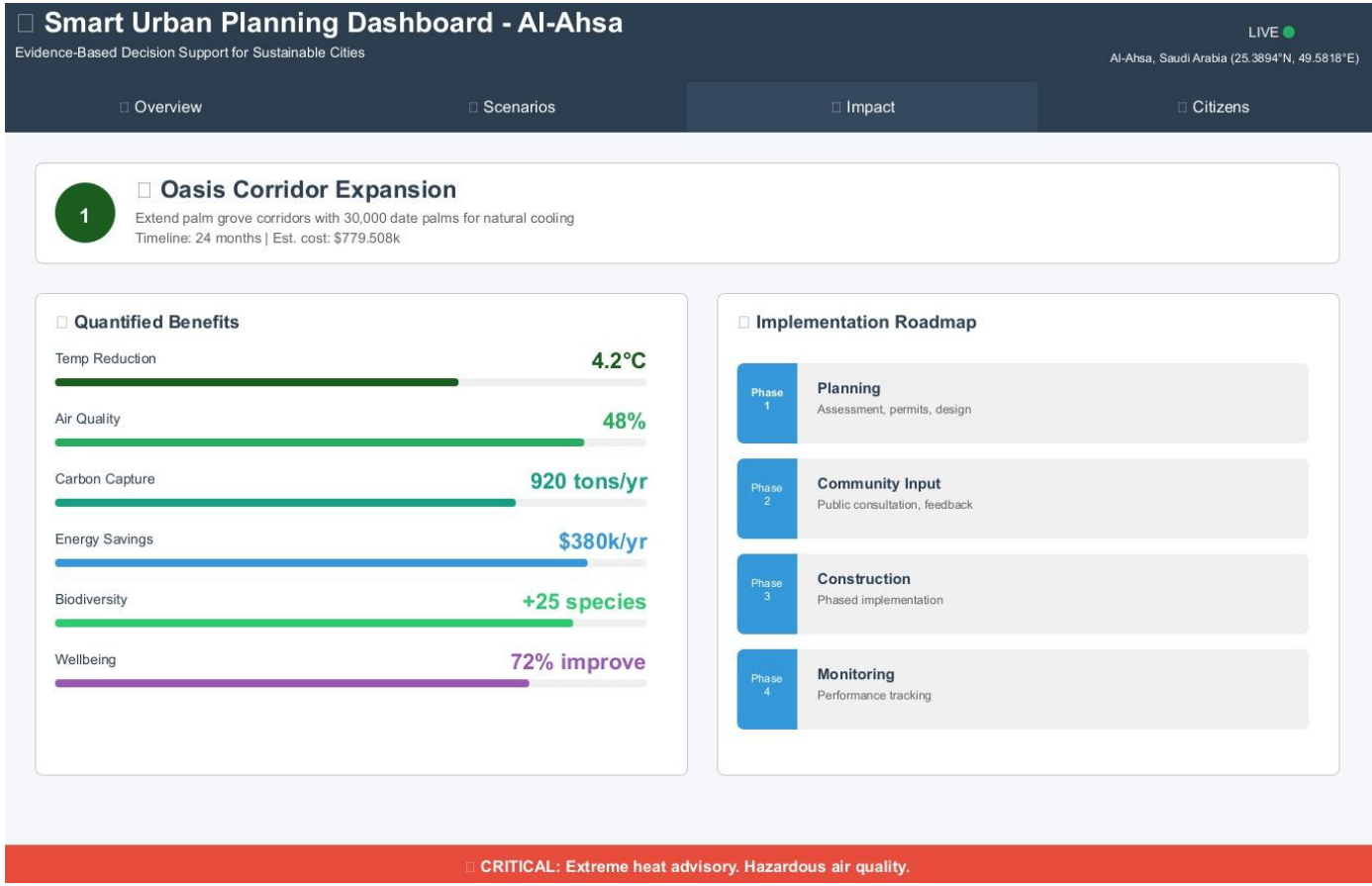


This page presents **the future of Al-Ahsa based on NASA data**.
First, we illustrated **the dangerous path if no action is taken**.
Then, we introduced **moderate and bold scenarios** showing how solutions like **oasis corridors** and **green mobility** can **drastically change the outcomes**.
The **benefits are precisely calculated** using NASA data:
- **38% reduction in temperature**,
- **58% improvement in air quality**,
- **80% increase in carbon capture**.

Most importantly, **bold intervention could achieve up to 75% health benefits**, proving that **data-driven decisions based on NASA insights protect both people and the environment**.
In short: this is a **forecasting and decision-making tool** that shows leaders **what happens if we act now — and how the future can improve.**



On the **Impact Analysis page**, we present the **detailed plan** for the top solution recommended by our system: **expanding the oasis corridors**.
This solution was **selected by AI** because it directly addresses **extreme heat** and **weak green coverage**, as confirmed by **NASA data**.
The **benefits are clear and measurable**:
•**4.2°C temperature reduction**,
•**48% improvement in air quality**,
•**920 tons of carbon captured annually**,
•**25 new species added to local biodiversity**,
•and a **72% improvement in residents' well-being**.
We also provide a **practical implementation map** with **clear phases** and **community participation** to ensure long-term success.
In short: this page answers leaders' key questions — **What do we build? How much does it cost? What impact will it have? And how do we make it happen?**

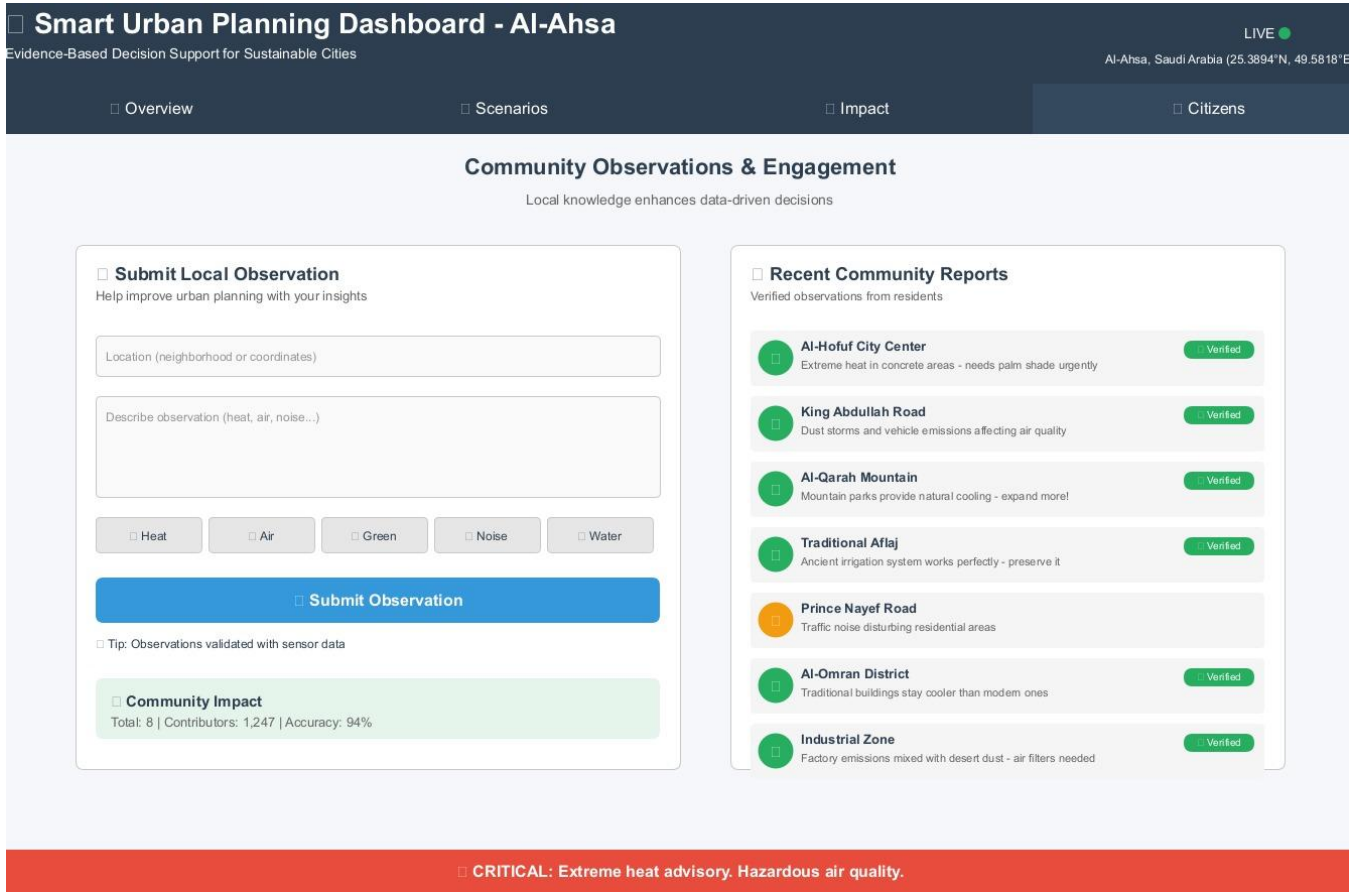


This page shows **how local residents contribute to urban planning** by combining **community insights with NASA data**. Citizens can report issues like **heat, pollution, noise, or lack of greenery**. Each report is **verified through sensors and NASA data**, ensuring **credible and accurate results**.
Examples:

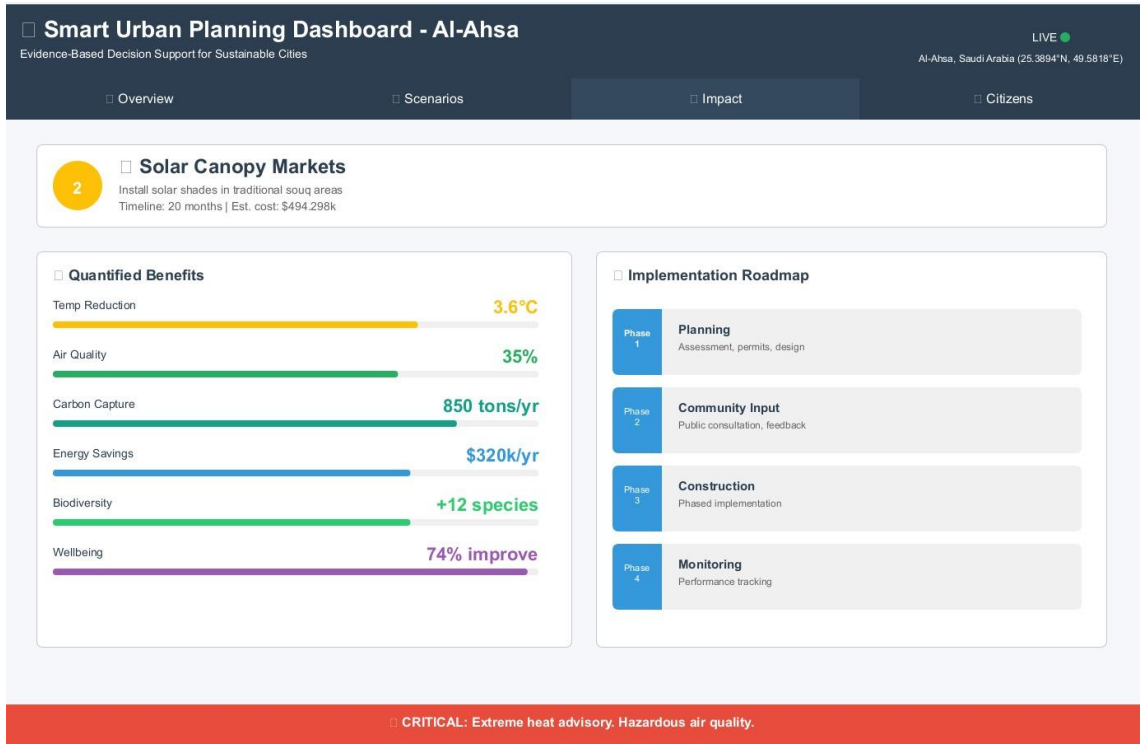
- **Al-Hofuf City Center:** high heat — needs palm shading.
- **King Abdullah Road:** dust and car emissions.
- **Industrial Zone:** mixed factory emissions — needs filters.

With **1,200+ contributors and 94% accuracy**, the community is **an active part of the solution**.

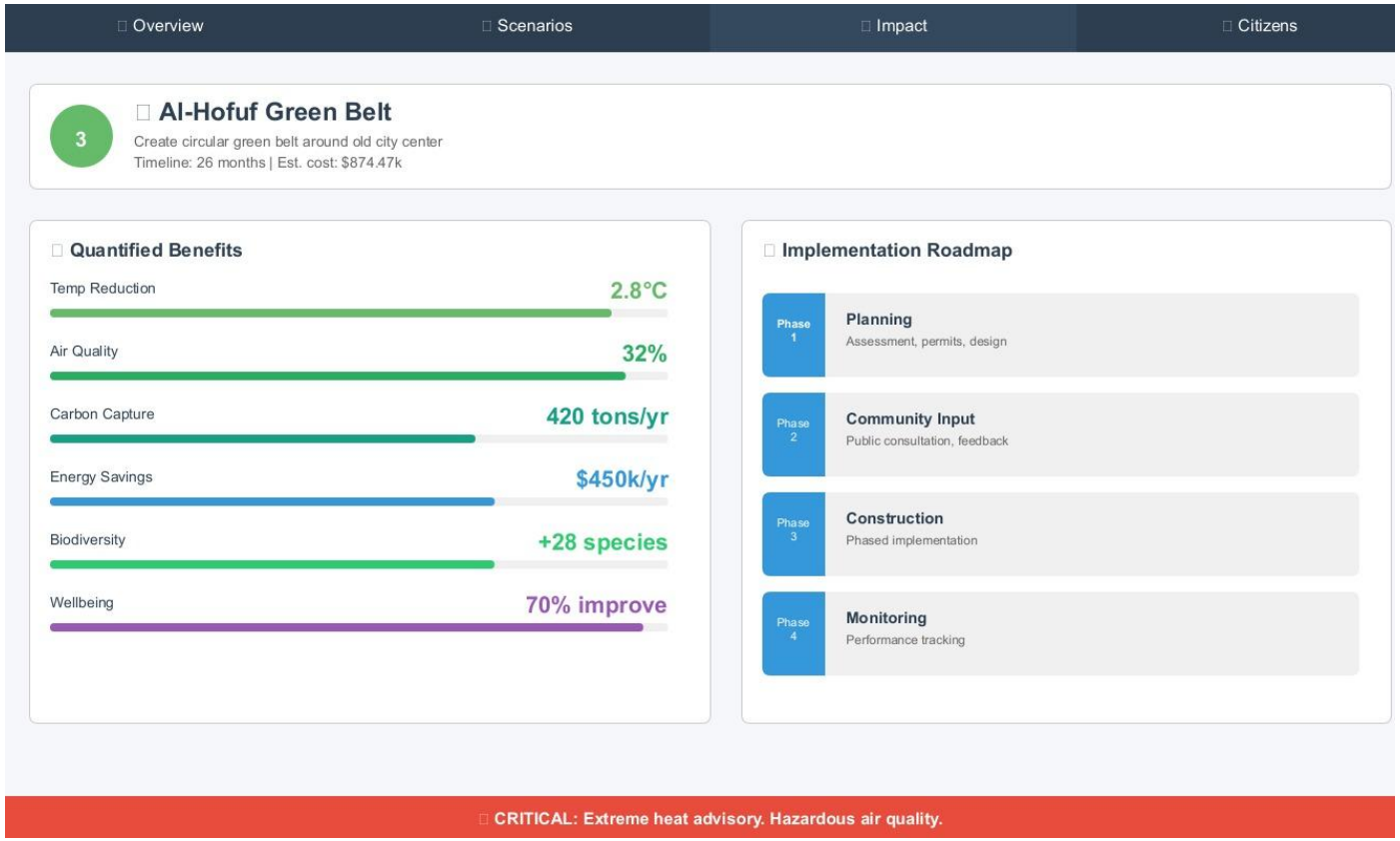
In short: this page proves that **real sustainability** comes from merging **NASA data with local knowledge**, making citizens **partners in shaping a healthier, smarter city**.



Our second solution is the **Solar Canopy Markets Project**.
This initiative tackles **two challenges at once**: **extreme heat in traditional markets** and the **need for clean energy**.
The **solar canopies** reduce temperature by **3.6°C**, while **generating solar power** that saves **$320,000 annually** and captures **850 tons of carbon** each year.
Most importantly, it improves the **well-being of visitors and vendors by 74%**, making markets **more comfortable and vibrant**.
It also **preserves the cultural identity** of traditional markets while adding a **sustainable economic dimension**.
In short: this project proves that our solutions deliver **multiple benefits at once — cooling, clean energy, economic savings, and cultural preservation**.



Our third solution is the **Al-Hofuf Green Belt Project**.
Its goal is to **create a circular green belt around the old city center** within **26 months**, at a cost of about **$875,000**.
The project will **reduce temperature by 2.8°C**, **improve air quality by 32%**, and **capture 420 tons of carbon annually**.
It will also **save $450,000 per year in energy costs**, **add 28 new biodiversity species**, and **boost community well-being by 70%**.
This is **not just a beautification project**, but a **vital response** to rising heat and severe air pollution warnings.
In short: the **Green Belt** is a **smart investment** with **environmental, economic, and health benefits**, making our city **more resilient to climate change**.

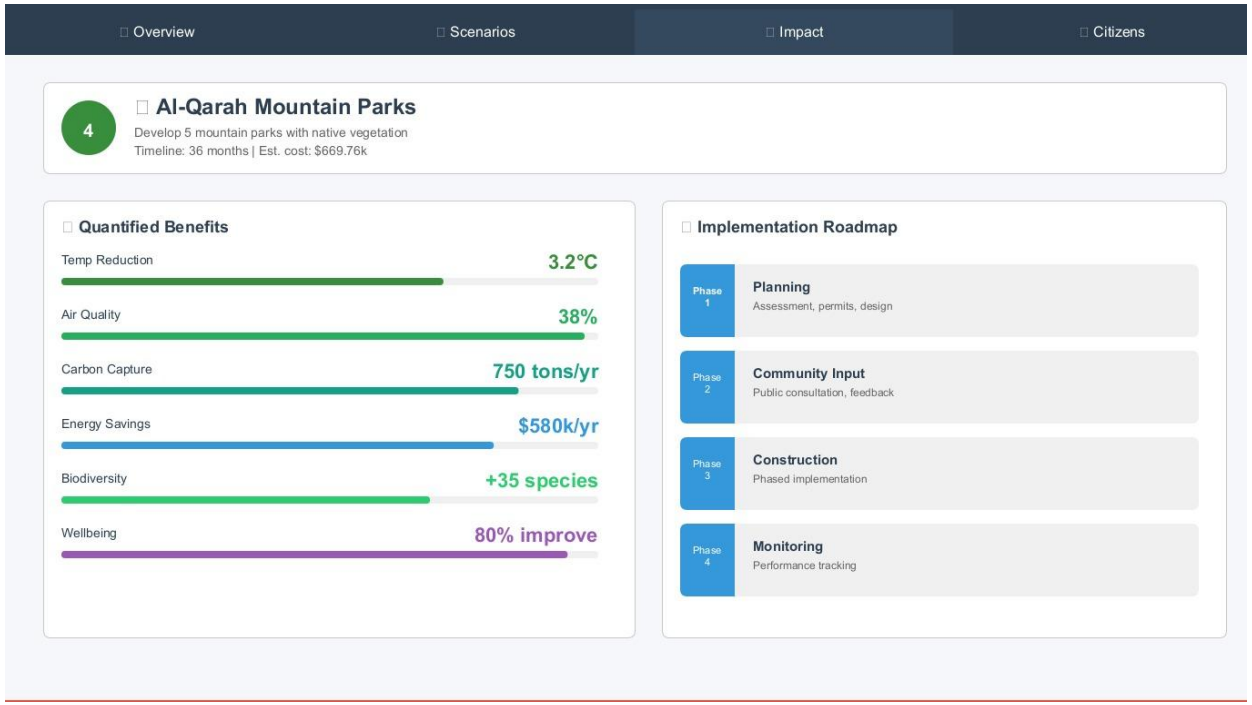


The **Smart Al-Qarah Mountain Parks Project** is a **36-month initiative** to develop **five mountain parks** using **native plants**. The project costs around **$670,000** and aims to **improve the environment and air quality**, **reduce heat**, **enhance biodiversity**, and **increase community well-being**.

We expect a **3.2°C temperature reduction**, a **38% improvement in air quality**, **750 tons of carbon absorbed annually**, and **$580,000 in yearly energy savings**. The project will also boost **community well-being by 80%** and support **over 35 species** of wildlife.

Implementation follows **four stages**: **planning, community engagement, construction, and monitoring**, ensuring goals are achieved effectively.

Compared to the **Al-Hofuf Green Belt Project**, this initiative offers **greater environmental impact and cost efficiency**, focusing on **developing natural recreational spaces for the community**.



- The **Green Mobility Network Project** is a **28-month urban initiative** to build **50 km of bicycle lanes** and an **electric bus system**, with a total cost of **$532,000**.
- The project aims to **improve air quality**, **reduce emissions**, and **enhance community well-being**. Expected outcomes include:
- **3.5°C temperature reduction**,
- **55% improvement in air quality**,
- **1,200 tons of carbon captured annually**,
- **$220,000 in yearly energy savings**,
- **increased biodiversity** and **75% improvement in residents' well-being**.
- It will be implemented in **four phases**: **planning, community engagement, construction, and monitoring**.
- **In short:** this is a **low-cost, high-impact investment**, especially effective in **reducing transportation emissions** and promoting **sustainable urban living**.