ASEAN GREEN ENTREPRENEURSHIP HACKATHON 2025

Theme: “Connecting Minds, Methods, and Machines to Co-Create Innovations for Global Challenges”

UrbanHeat.AI

COOLING CITIES, SAVING LIVES

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Presented by UMT 2

Problem Statement

- Urban heatwaves are intensifying due to climate change and poor city planning.
- Vulnerable groups (elderly, B40 households, outdoor workers) face the highest risk.
- Cities lack real-time urban heat monitoring, forecasting, or response tools.
- Traditional weather reports don’t reflect local heat exposure or socio-demographic vulnerabilities.

Our Solution

A lightweight, AI-powered tool that empowers cities and citizens to:

- Map urban heat hotspots in real time using satellite data
- Overlay vulnerability data (income, green cover, age, density)
- Forecast future heatwaves using machine learning
- Alerts the public with heat warnings and safe routes through mobile interfaces
- Support planners with a dashboard to test cooling interventions (e.g. trees, water bodies)

Value to Users

General public:

- Get real-time alerts and avoid high-risk zones

Planners/NGOs:

- Use the dashboard for data-driven urban cooling decisions

Governments:

- Allocate resources effectively to high-risk communities

Market Analysis & Potential

Target Market

ASEAN urban cities facing rapid development, high density, and increasing heat risks

- Starting with: Kuala Lumpur → Jakarta → Manila → Bangkok

Potential Users

- City governments & disaster management units (e.g., DBKL, NADMA)
- NGOs and health agencies serving B40 groups
- Urban planners & sustainability consultants
- Academics and researchers in urban climate and adaptation

Value Proposition

Why UrbanHeat.AI is Valuable

- Creative fusion of remote sensing + vulnerability data
- Transforms complex climate data into actionable urban alerts
- Lightweight, cloud-based — easy to deploy, scale, and update
- Customizable to different cities using open-source or local data

Technology Stack & TRIZ Application

TOOLS & DATA:

- Remote Sensing: MODIS, Sentinel-2, NDVI, LST (Google Earth Engine)
- Models: Random Forest + Convolutional Neural Networks (CNN)
- Frontend: Streamlit + React Native + Leaflet.js
- Backend & Deployment: Python, Firebase

TRIZ PRINCIPLES APPLIED:

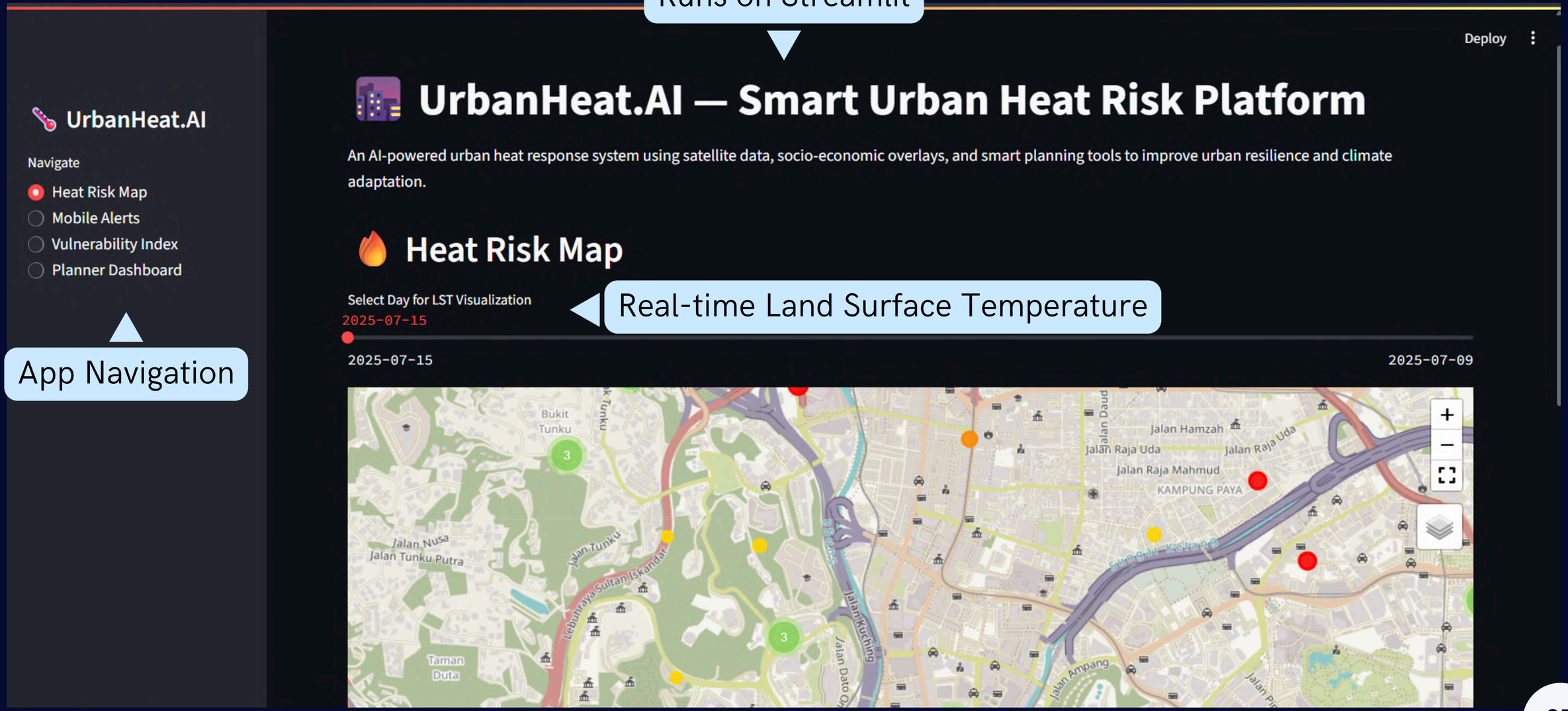
1. Prior Action – Predict & alert before heat events happen
2. Segmentation – Micro-target hot zones for specific solutions
3. Resource Utilization – Use public data, smartphones, and local IoT devices
4. Automation – Self-updating maps, AI-powered alerts

Key Features

Feature	Description
1. **Heat Risk Map**	Uses satellite + AI models to detect temperature anomalies city-wide
2. **Vulnerability Index**	Combines LST with NDVI, income, age, land use to find critical areas
3. **Mobile Alerts**	Push notifications and SMS suggest safe routes & give heat safety tips
4. **Planner Dashboard**	Visual platform for testing tree planting or green zone interventions

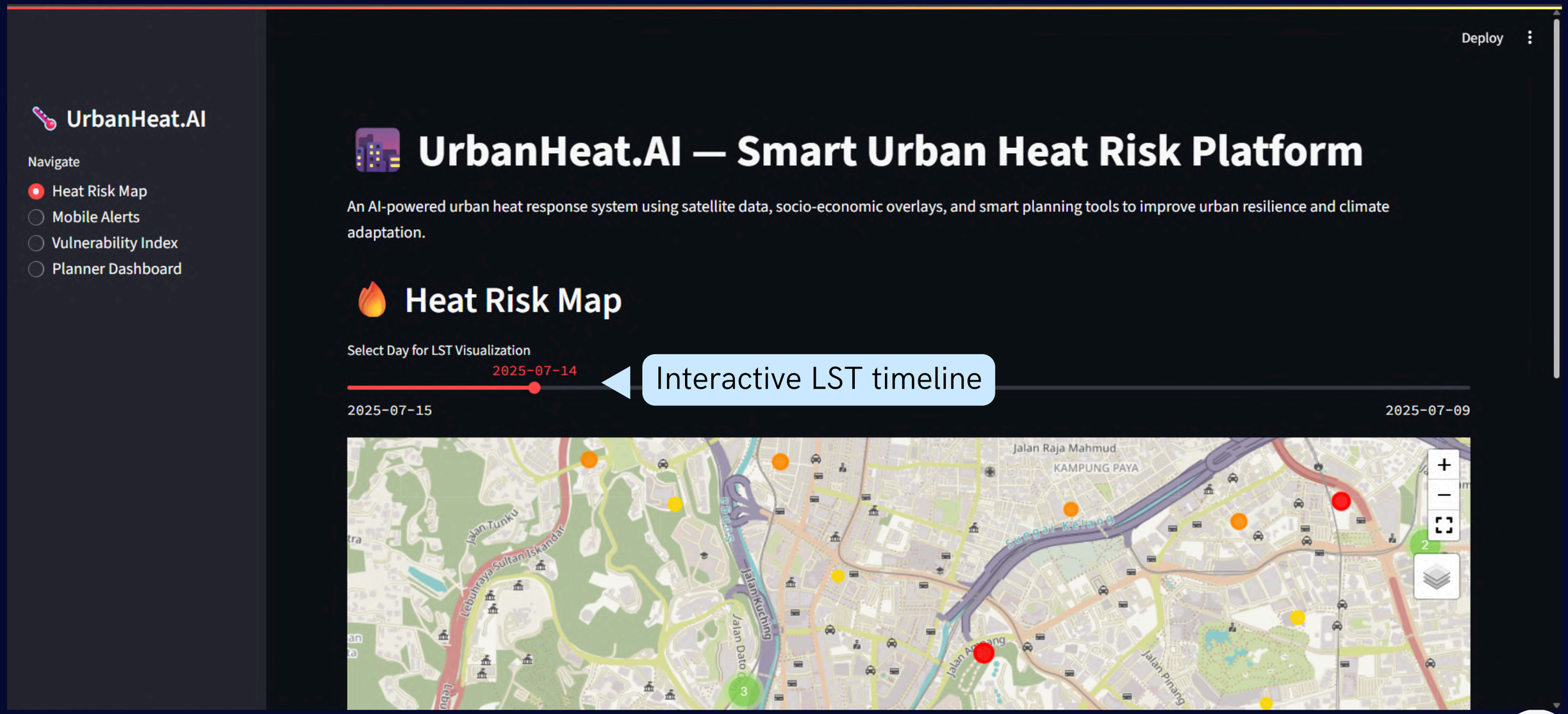
Prototype & Test:

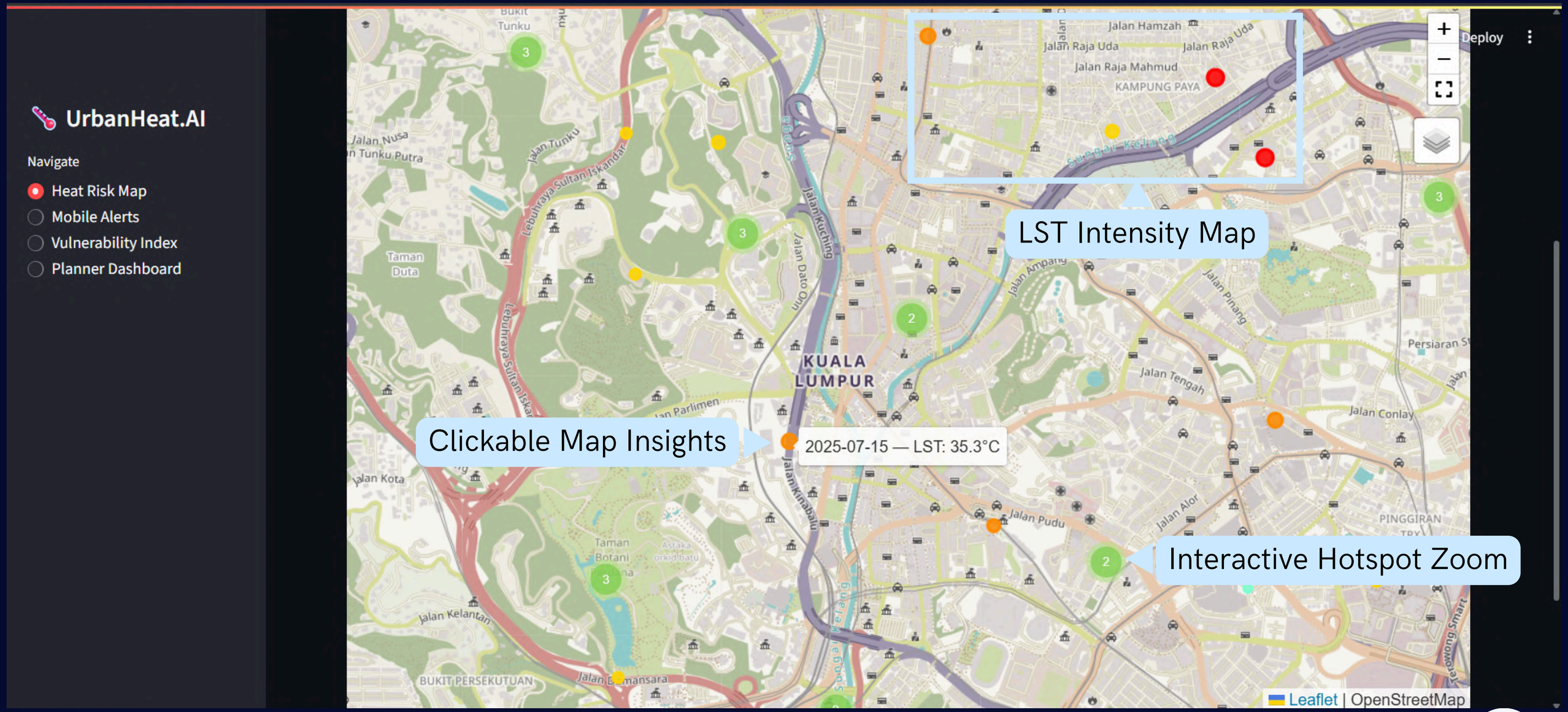
Runs on Streamlit



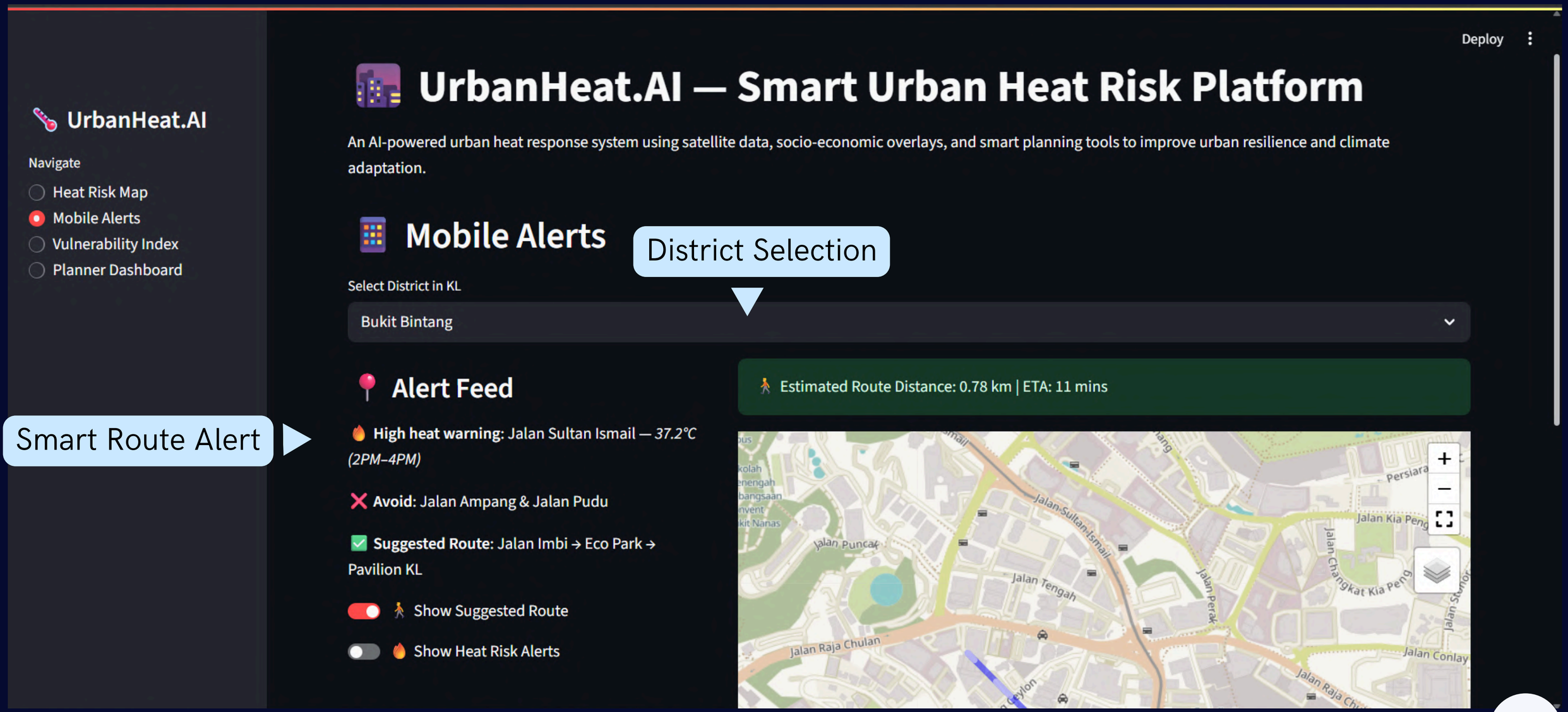
Real-time Land Surface Temperature

App Navigation


Deploy
UrbanHeat.AI
Navigate
Heat Risk Map
Mobile Alerts
Vulnerability Index
Planner Dashboard
UrbanHeat.AI — Smart Urban Heat Risk Platform
An AI-powered urban heat response system using satellite data, socio-economic overlays, and smart planning tools to improve urban resilience and climate adaptation.
Heat Risk Map
Select Day for LST Visualization
2025-07-14
Interactive LST timeline
2025-07-15
2025-07-09
Jalan Raja Mahmud
KAMPUNG PAYA
Jalan Tunku
Lebuhraya Sultan Iskandar
Jalan Kuching
Jalan Pinang



Heat Risk Map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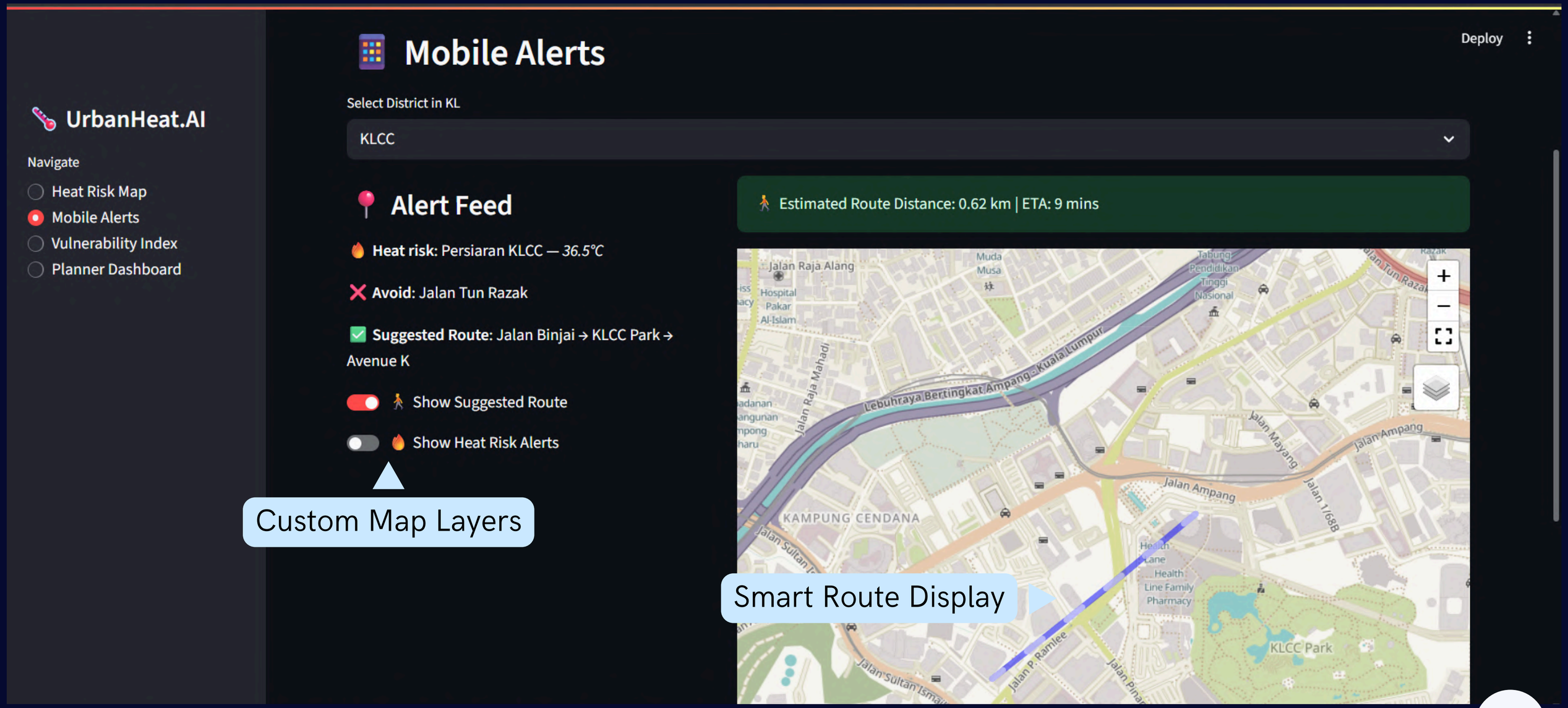
UrbanHeat.AI — Smart Urban Heat Risk Platform
An AI-powered urban heat response system using satellite data, socio-economic overlays, and smart planning tools to improve urban resilience and climate adaptation.
Mobile Alerts
District Selection
Select District in KL
Bukit Bintang
Alert Feed
Smart Route Alert
High heat warning: Jalan Sultan Ismail — 37.2°C (2PM–4PM)
Avoid: Jalan Ampang & Jalan Pudu
Suggested Route: Jalan Imbi → Eco Park → Pavilion KL
Show Suggested Route
Show Heat Risk Alerts
Estimated Route Distance: 0.78 km | ETA: 11 mins
Jalan Sultan Ismail
Jalan Puncak
Jalan Tengah
Jalan Raja Chulan
Jalan Perak
Jalan Kia Peng
Jalan Conlay


UrbanHeat.AI
Navigate
Heat Risk Map
Mobile Alerts
Vulnerability Index
Planner Dashboard
Mobile Alerts
Deploy
Select District in KL
KLCC
Alert Feed
Heat risk: Persiaran KLCC — 36.5°C
Avoid: Jalan Tun Razak
Suggested Route: Jalan Binjai → KLCC Park → Avenue K
Show Suggested Route
Show Heat Risk Alerts
Custom Map Layers
Estimated Route Distance: 0.62 km | ETA: 9 mins
Smart Route Display
Jalan Raja Alang
Hospital Pakar Al-Islam
Muda Musa
Tabung Pendidikan Tinggi Nasional
Jalan Tun Razak
Jalan Raja Mahadi
Lebuhraya Bertingkat Ampang - Kuala Lumpur
Jalan Mayang
Jalan Ampang
Jalan 1/68B
KAMPUNG CENDANA
Jalan Sultan Ismail
Health Line Family Pharmacy
KLCC Park
Jalan P. Ramlee

Deploy

UrbanHeat.AI

Navigate

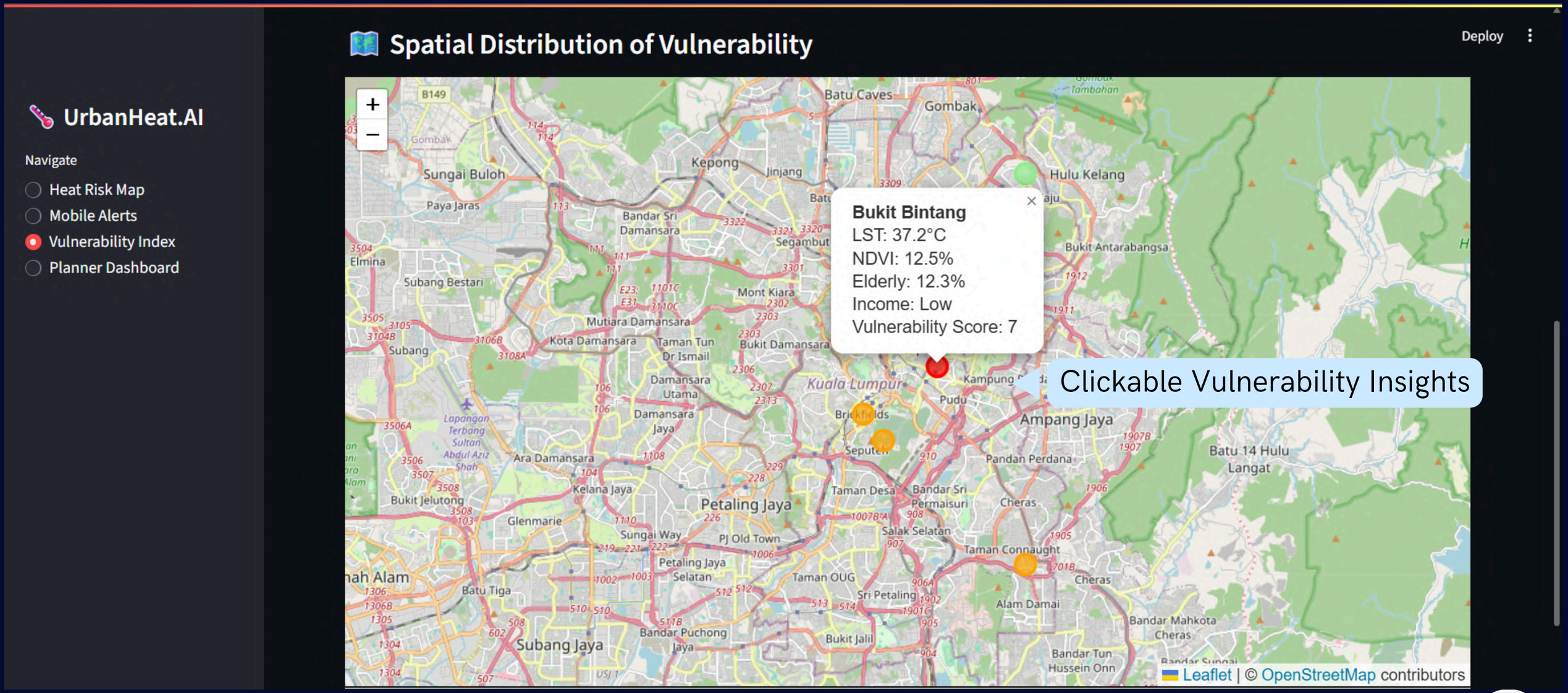
- Heat Risk Map
- Mobile Alerts
- Vulnerability Index
- Planner Dashboard

- **Targets high-risk areas** for heat interventions (e.g., tree planting, cooling centers).
- **Supports policy decisions** by showing where vulnerable populations live.
- **Raises community awareness** so residents understand their heat risk level.

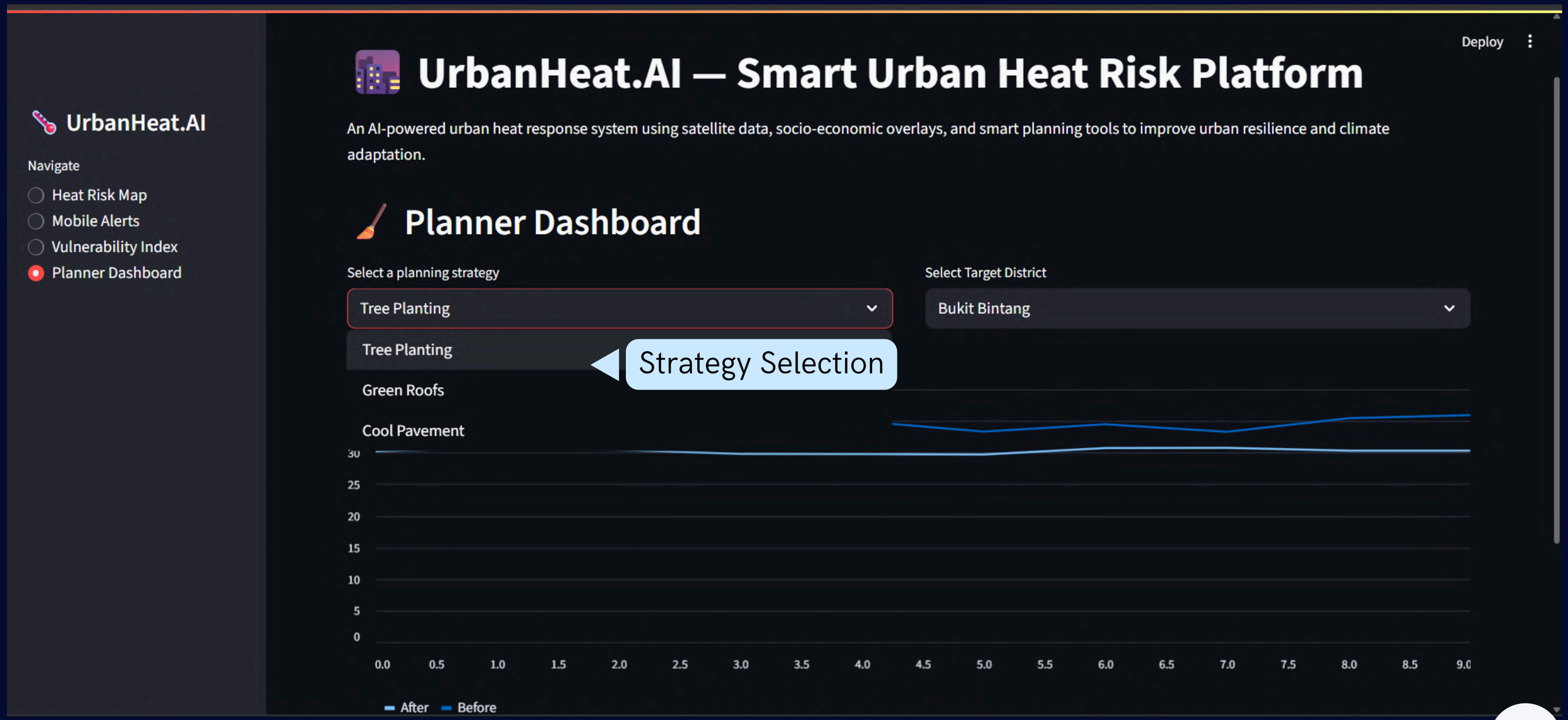
Vulnerability Index

	District	LST_(°C)	NDVI_(Green_%)	Elderly_(%)	Income_Level	Vulnerability_Score
0	Bukit Bintang	37.2	12.5	12.3	Low	7
1	KLCC	36.5	18.3	9.8	High	4
2	Brickfields	35.9	22.4	11.5	Medium	4
3	Cheras	35.4	28.7	13.2	Low	5
4	Setapak	36.1	19.1	10.6	Medium	6
5	Sentul	36.8	15.5	14.1	Low	8
6	Wangsa Maju	35.7	25.2	12	High	2
7	Seputeh	36	20	13.5	Medium	5
8	Titiwangsa	35.3	23.3	9.5	High	2

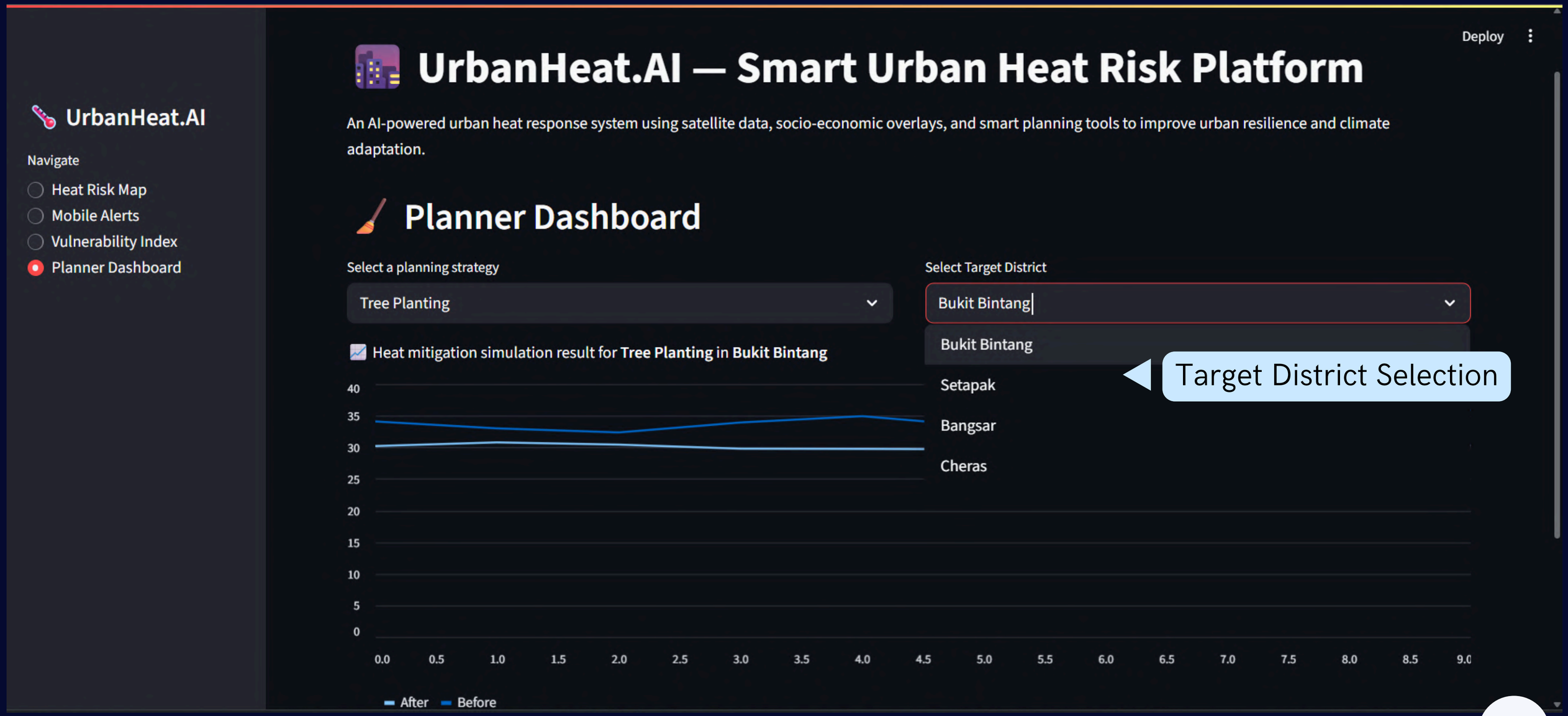
Spatial Distribution of Vulnerability



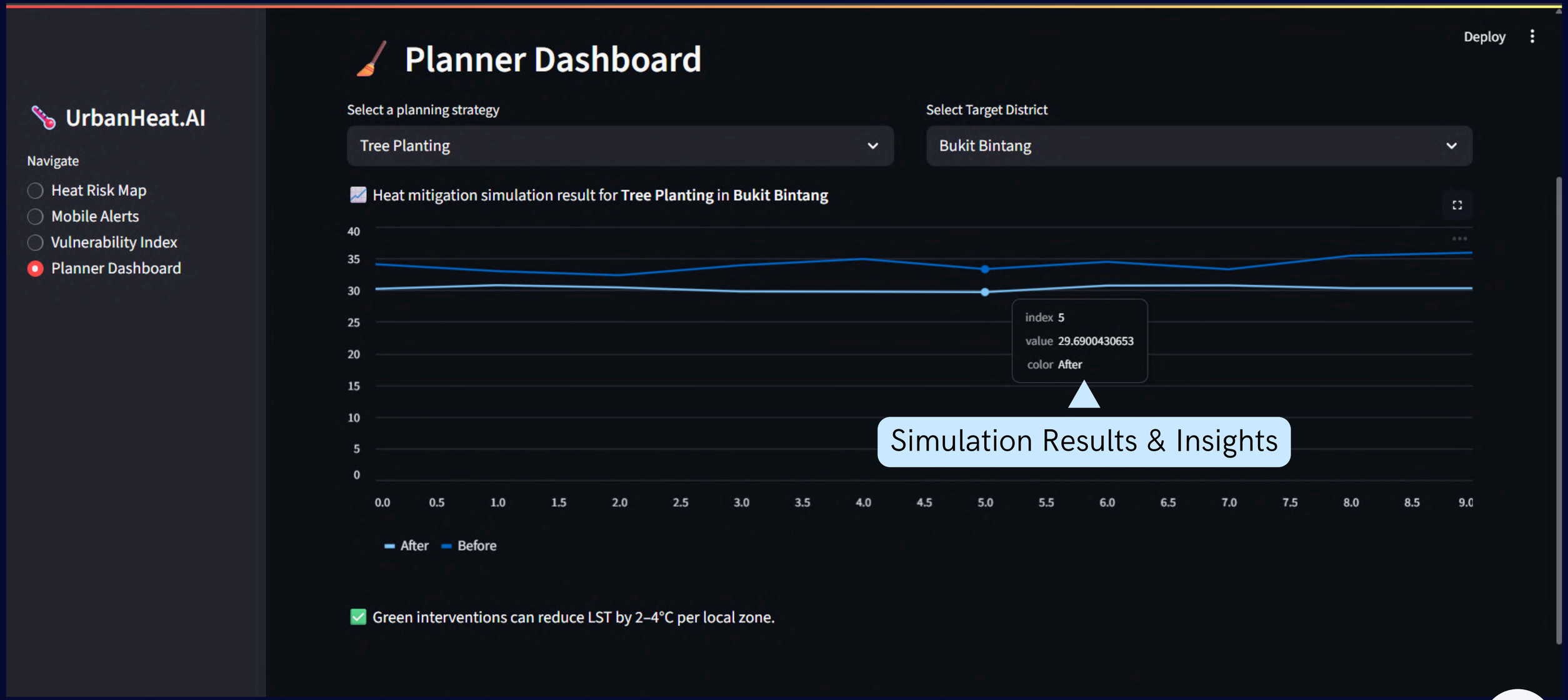
Vulnerability Index



Planner Dashboard



Planner Dashboard



Simulation Results & Insights

Planner Dashboard

Feasibility and Sustainability of Solution

✓ **Why It's Feasible**

- Built using open datasets (MODIS, Sentinel, DOSM)
- Uses Streamlit, Google Earth Engine — low infrastructure cost
- Deployable via browser/mobile with minimal hardware
- Basic alert system with SMS & routing mockup
- Can plug into existing planning tools or disaster frameworks

✓ **Why It's Sustainable**

- Works on a freemium model for governments & NGOs
- Scalable via regional partners (ASEAN Smart Cities, UNDP)
- Maintained by local data teams / students (open-source training base)

Key Partners

1. DBKL
2. Think City
3. UNDP
4. Universities
5. Smart Selangor
6. Red Crescent

Key Activities

1. Map processing
2. Alert generation
3. Partner engagement

Key Resources

1. Satellite data
2. AI models
3. Developers
4. Streamlit/Google Earth Engine

Value Propositions

1. AI-powered urban heat risk detection
2. Alerts
3. Planning simulation

Customer Relationships

1. Co-development with city stakeholders
2. Feedback loops through field tests

Channels

1. Web dashboard
2. Mobile alerts
3. NGO
4. Community partners

Customer Segments

1. City governments,
2. NGOs
3. Urban planners
4. Citizens (especially B40)

Cost Structure

1. Platform Development & Maintenance
2. Cloud Infrastructure & Data Hosting
3. Data Processing & Storage
4. User Outreach & Community Engagement
5. Training & Capacity Building

Revenue Streams

1. Pilot packages
2. NGO/Gov grants
3. Software as a Service (SaaS) for planning dashboards

Real-World Impact

Area	Impact Outcome
Health	Reduces heat-related illnesses and hospitalizations
Equity	Focuses on at-risk communities in underserved areas
Planning	Enables better tree zoning and green corridor design
Climate Resilience	Helps cities adapt faster to a warming climate

SDG Alignment:

References

Journal Articles:

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Thank you!