

How It Was Built, What It Uses, and Why It's Safe

A defense brief for leadership and IT / Enterprise Architecture. **PILOT — PRELIMINARY** · chapters.jbf.com · 2026-06-21

The Chapter Executive Director Intelligence Platform turns the data the Red Cross already owns into a single, plain-English picture for any of the **226 chapters** — geography, demographics, hardship (ALICE), disaster risk and history, and Red Cross mission activity — as an interactive national map plus a downloadable report per chapter. It is a **pilot**, built fast and cheaply, designed to be **safe by construction**: no personal data, no live system connections, no backend to attack, and every number traceable to a source.

How it was built

The platform was built by a Red Cross GIS practitioner using **standard, open-source tools** — Python for the data pipeline and Leaflet for the map. The build is transparent and reproducible: every figure is pulled from a named Red Cross or government source (below), joined by county code, and rendered automatically — nothing is hand-keyed or estimated. Where a narrative summary is included, it is written over **verified data anchors** and flagged for human review before use.

The result is **reproducible**: one command rebuilds any chapter from source; the whole system is plain Python + static files, fully owned by the Red Cross, with no proprietary lock-in.

The technology stack

LAYER	TECHNOLOGY	WHY
Interactive map	Leaflet (open-source) + open basemap tiles + GeoJSON	Fast, free, public — no client license, no sign-in
Chapter reports	Python — GeoPandas, matplotlib, WeasyPrint	Searchable, print-quality PDF + web; fully automated
Build engine	Python (the <code>cep</code> package)	Pulls data, joins by county FIPS, renders output
Data sources	ArcGIS Online (org) + government & internal CSVs	The Red Cross's own authoritative data
Hosting	Vercel — static files only	No server, no database, instant, free-tier

Data & provenance

Every metric carries a **source-ledger entry**. The governing rule: **if a number can't be traced to a county, it is not shown** — the report marks it "coming next" rather than estimating. County data is joined by **FIPS code** (the federal county identifier), never by name, so figures cannot misattribute across same-named counties.

Live, sourced data

- Geography + 2023 demographics, ALICE & poverty — internal reference tables
- Disaster risk (FEMA NRI, CDC SVI) + FEMA declaration history
- Home fires (public FLARE) + Red Cross response
- Smoke-alarm installs, home-fire responses, blood/BioMed — org ArcGIS Online

Flagged as pending (never faked)

- Relief spending by county — under a formal, tiered data request; each dollar will carry an attribution tier and coverage %
- CAP risk layer — pending canonical source confirmation

Not collected at all

- No names, addresses, or any personal/donor PII (see Governance)

- Documented lives saved (Home Fire Campaign) — 2,682 nationally, geo-matched to county

Governance & security FOR IT / EA

- **No PII.** Where source layers contain individuals (e.g. DAT volunteers), only **counts and anonymized positions** are requested — names, phones, and supervisors are never fetched or stored.
- **No live connections from the published site.** ArcGIS Online is queried **only at build time** by the developer, using sanctioned 3-legged OAuth. The deployed site is **static HTML/PDF** — it makes no calls to ArcGIS, holds no credentials, and exposes no token.
- **No backend, no database.** Nothing to breach server-side; the attack surface is a folder of files.
- **Internal pilot, clearly labeled.** Every page carries a "Pilot — preliminary, may be inaccurate" banner and an "About this Pilot" notice; it is not a system of record and not donor-facing.
- **Data residency.** Output is derived, aggregated county-level figures — no raw operational records leave Red Cross systems.

Anticipated challenges — and the answers

"How do we know the numbers are right?"

Every figure is pulled from a named Red Cross or federal source and carries a **source-ledger entry**; county data is joined by FIPS code, never by name, so it cannot misattribute. Anything that can't be traced to a county is **withheld, not estimated**, and the whole report is reproducible from source.

"Is the data safe and compliant?"

Yes by construction: **no PII is collected**, ArcGIS is touched only at build time through sanctioned OAuth, and the live site is static with no credentials, no backend, and no data egress. Output is aggregated county-level figures, internal-only, labeled pilot.

"Why not the official Esri / Microsoft tools?"

This is **complementary, not competing**. It consumes the same authoritative ArcGIS Online data the enterprise already maintains. Leaflet + Python + static hosting were chosen for **speed, near-zero cost, and license-free public delivery** — a rapid pilot layer. It can embed in or hand off to the sanctioned stack (ArcGIS Online, SharePoint / OneSource) for production.

"Is this official, and who owns it?"

It is an **internal pilot**, explicitly labeled as such, owned by the Red Cross and fully reproducible from source (no vendor lock-in). If adopted, there is a clean path to a sanctioned, IT-governed production version — the data sources and method don't change.

Cost, reproducibility & enterprise fit

Cost: free-tier static hosting; no servers or licenses to run it. **Reproducibility:** one command rebuilds any chapter; design and data standards are enforced by an automated conformance check. **Enterprise fit:** the output is standard web and PDF that can be embedded in or handed off to the sanctioned stack (ArcGIS Online, SharePoint / OneSource) for a governed production version — the data sources and method do not change.

Reproducibility — proven

To confirm the platform depends on no single person or bespoke tool, the full data-to-report pipeline was rebuilt independently as a single **ArcGIS Online Python Notebook** using only standard libraries (pandas, GeoPandas, matplotlib) and the same authoritative sources. It reproduced a chapter's figures **exactly** — population, households, hardship, and home-fire counts all matched — running inside the Red Cross ArcGIS environment with no outside dependency. The method is conventional GIS; any skilled analyst can run or maintain it.