

Let's deliver smarter, connected megaprojects together

By: Rajiv Agarwal and Vernon Harley



Mega-projects need a digital backbone

The sector has historically lagged behind other industries on digital investment and maturity; however, this mindset is starting to shift with digital ambitions exponentially increasing in order to meet the demand for scale and speed.



“Digital initiatives are no longer a novel concept. The construction industry has made impressive investments in digital programs—particularly among owner-operators and global engineering, procurement and construction companies (EPCs).

Challenges

- **9 out of 10 projects have cost overruns** – regularly up to 50%, and not uncommonly >50%¹
- **2/3^{rds} of organisations are not getting the value from data** due to:
 - A strategic failure to build the right operating environment and data-driven culture.
 - An inability to operationalize data and technology for more effective decision-making as well as completion of projects on time and within budgets.
- **Digital deficit becomes clear midway** through delivery with challenge of resolving in-flight.

The Benefits of Data-Centricity

- True data-centricity **can lead to 5.8% increase in operating margin and 6.6% incremental ROI on CapEx.**²
- **Effectively adopted digital enablers** combined with additional regulatory, process and people changes **could unlock c.15% productivity improvement and c.6% cost savings.**³
- **Digitising capital projects delivery** can bring value across the E2E delivery lifecycle and asset management with **5%-10% reduction in build costs and 10%-20% reduction in operating costs** during in-life asset management.⁴

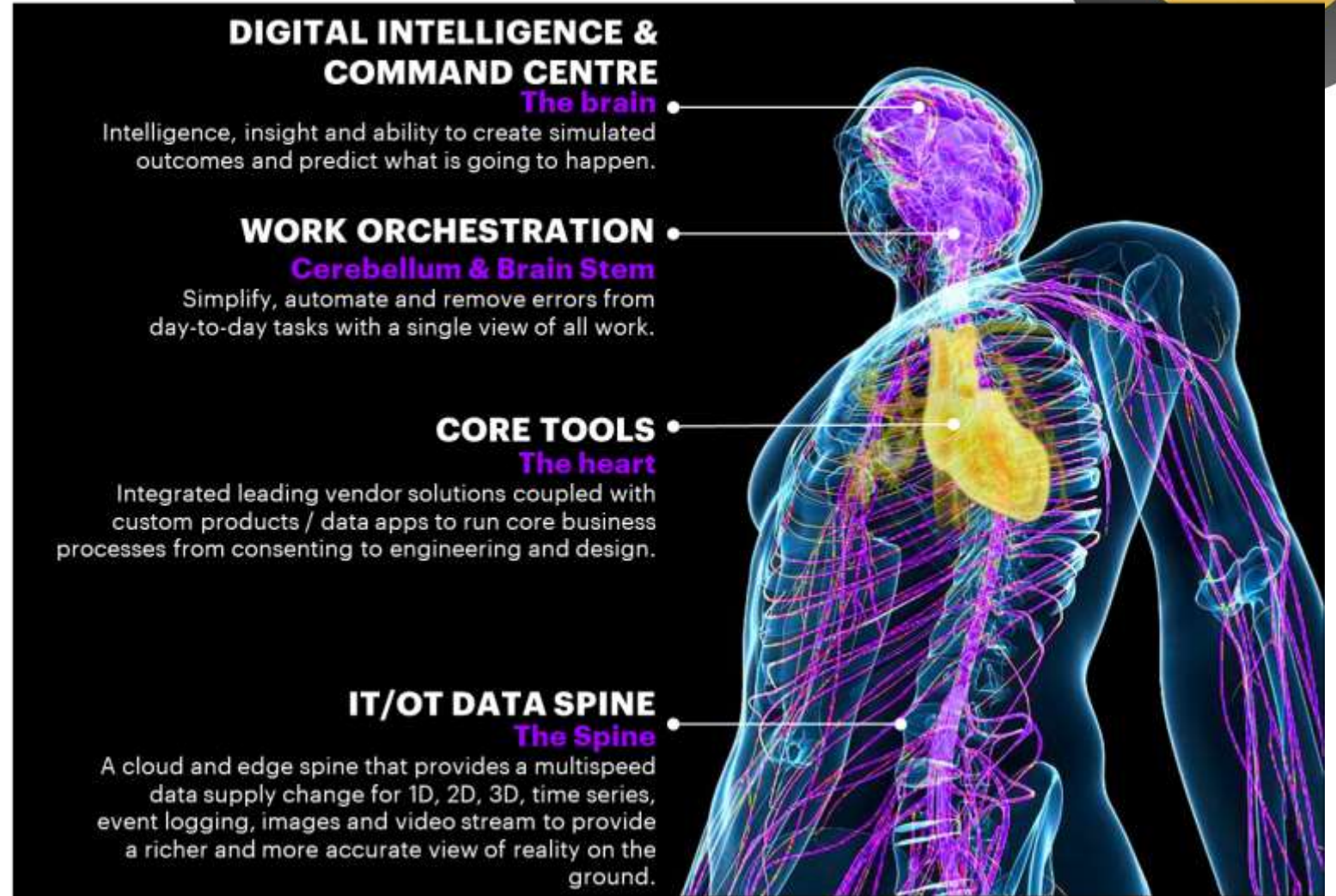
Digital Backbone

A digital backbone turns data into a strategic asset aligned to the programme and project priorities and value levers.

It operates across the capable client / integrator and wider partner ecosystem to provide data integration and a common view.





Everyone applies the same data standards and structures and uses common tools and techniques to drive consistency and programmatic delivery.

By digitising the E2E process, prediction and optimisation become possible with new techniques that allow a principle of measure twice and cut once.



Value of Digital Backbone

Operational Improvements

<ul style="list-style-type: none"> ▪ Re-use and Leverage of Existing Data and Assets ▪ Compress Basic Engineering Schedule through Collaboration ▪ Integrate Design & Cost along with 4D Plan for Real Time Cost Impact ▪ Standardize & Optimize Equipment Design / Layout ▪ Intelligent Specs & Schematics: Equipment, Process line & Pipe tagging 		<p>Improve Design & Velocity</p>
<ul style="list-style-type: none"> ▪ Connected Industrial Worker and Construction Automation ▪ 4D Construction Workforce Planning to optimize Schedule ▪ Mobile enabled People and asset location tracking, field collaboration, safety alerts & analytics along with ease of access to Engineering ▪ Digital site surveillance and inspection ▪ Digital thread alignment between design and inventory 		<p>Efficient Construction</p>
<ul style="list-style-type: none"> ▪ Enhanced Workforce planning for turnaround maintenance activities ▪ Inspections: Data Accessibility & Route Optimization ▪ Enhanced Facilities Maintenance ▪ 3D visualization (simulation) 		<p>Improve Operations & Maintenance</p>
<ul style="list-style-type: none"> ▪ Optimize Design from Safety Perspective ▪ Accurate Categorization of Hazard Area ▪ Enhanced Safety & Quality Audit Facilitation ▪ As licensed / As designed / As built coherence and traceability ▪ Ease communication and exchange of information with Regulator ▪ Use of intelligent specs and schematics, enhanced safety 		<p>Enhanced Risk & Safety Management</p>

Business Outcomes

Efficiency	<p>>99%¹ Reliability for Operating Plants</p>	<p>3-5% Reduction in O&M Costs</p>
	<p>5-10%² Increase Operational Efficiency</p>	<p>6-10%³ Reduction in Brownfield Cost</p>
Profitability	<p>~5% Increase in ROCE across portfolio</p>	<p>1-2% Increase in Net Revenue Cash Flow</p>
Speed	<p>5% Acceleration towards Project Completion</p>	<p>Avoid Overruns</p>
Predictability	<p>Improve predictability through better insights</p>	

Digital Backbone Offerings

Connected Project & Portfolio Management

Maximizing value from project management information

Connected Construction

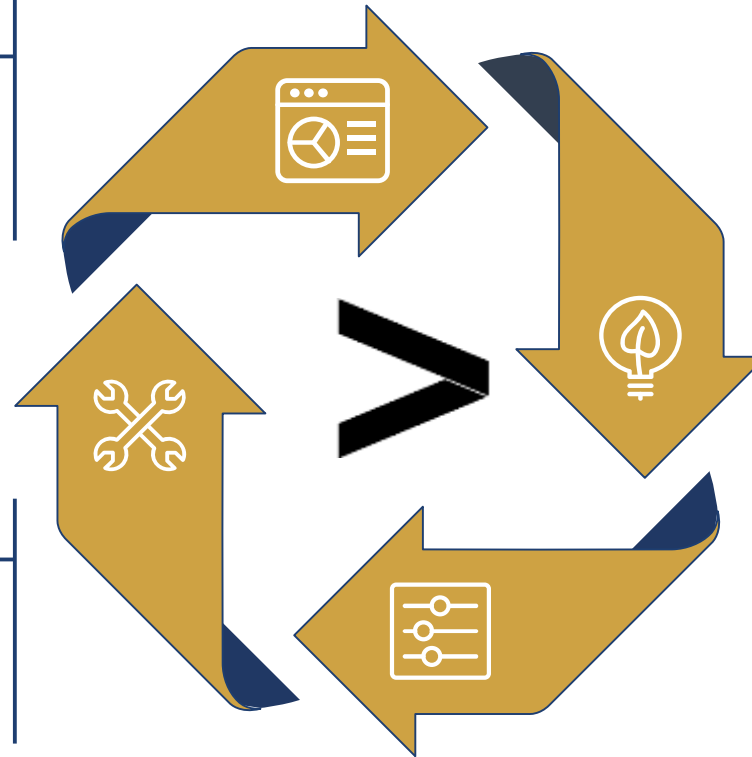
Combine physical technology and analytics to provide a real-world view of your projects

Control Tower

Access data efficiently across various PPM tools in a single system

Sustainability

Achieving enterprise' sustainability goals driven by successful execution of capital projects



Live demos of all solutions are available by request

Maximizing value from Project & Portfolio Management Information



Challenges we are solving for

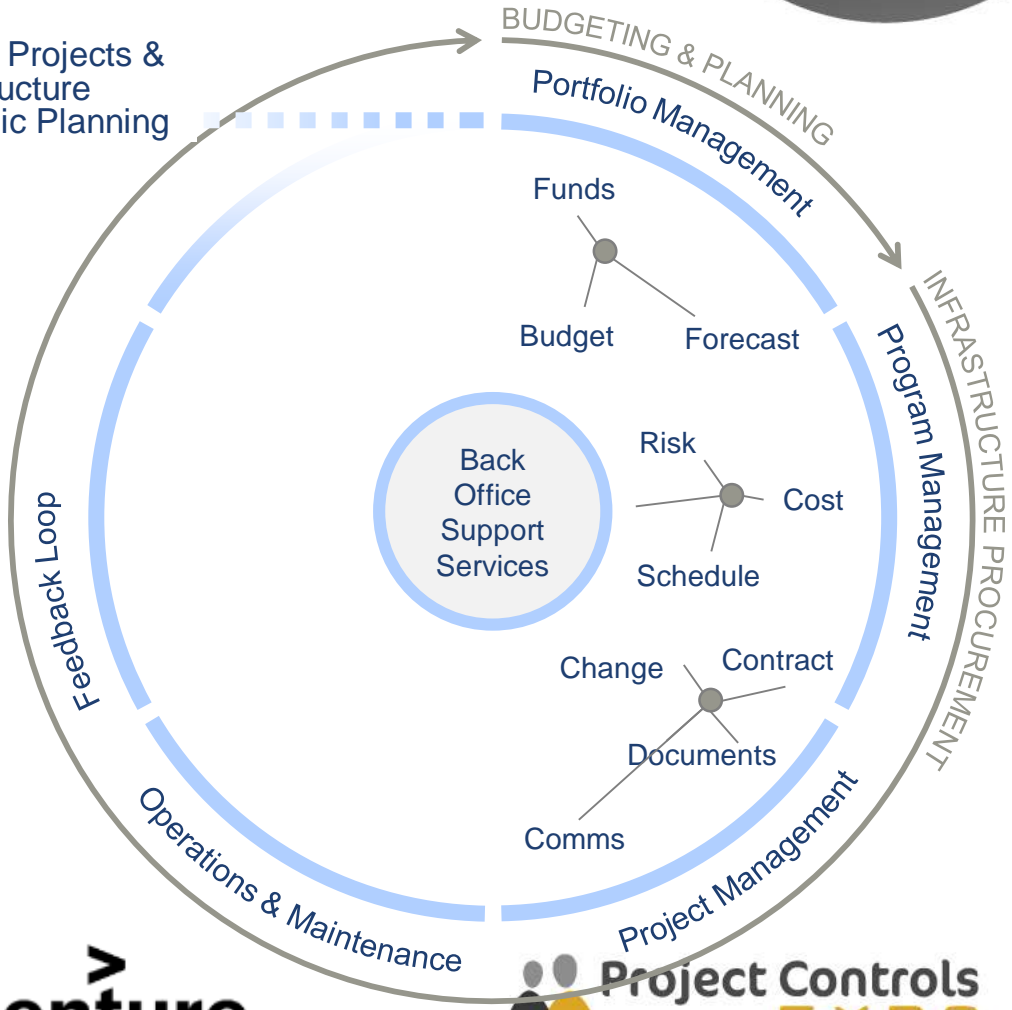
In many cases Infrastructure Delivery Owner Operators and EPC organizations currently have multiple disparate **Project & Portfolio Management Information systems** in their technology landscapes that do not have the required level of integration across people, process, technology and data dimensions.

In the area of project & portfolio management we are solving for...

- An operating model, data taxonomy & business processes to be fully defined, integrated & adopted
- Multiple tools and systems rationalised and integrated to enable connected data
- Multiple stakeholders with a single version of truth for improved decision making

- An integrated delivery framework
- One integrated Solution
- Single Version of Truth Analytics

Capital Projects & Infrastructure Strategic Planning



Our Offering

Connected Project & Portfolio Management (cPPM) is an offering that includes all the methods, tools, accelerators, and solutions to help our clients deliver major capital portfolios, programmes and projects in a more integrated manner across people, process, technology and data dimensions

cPPM offers...



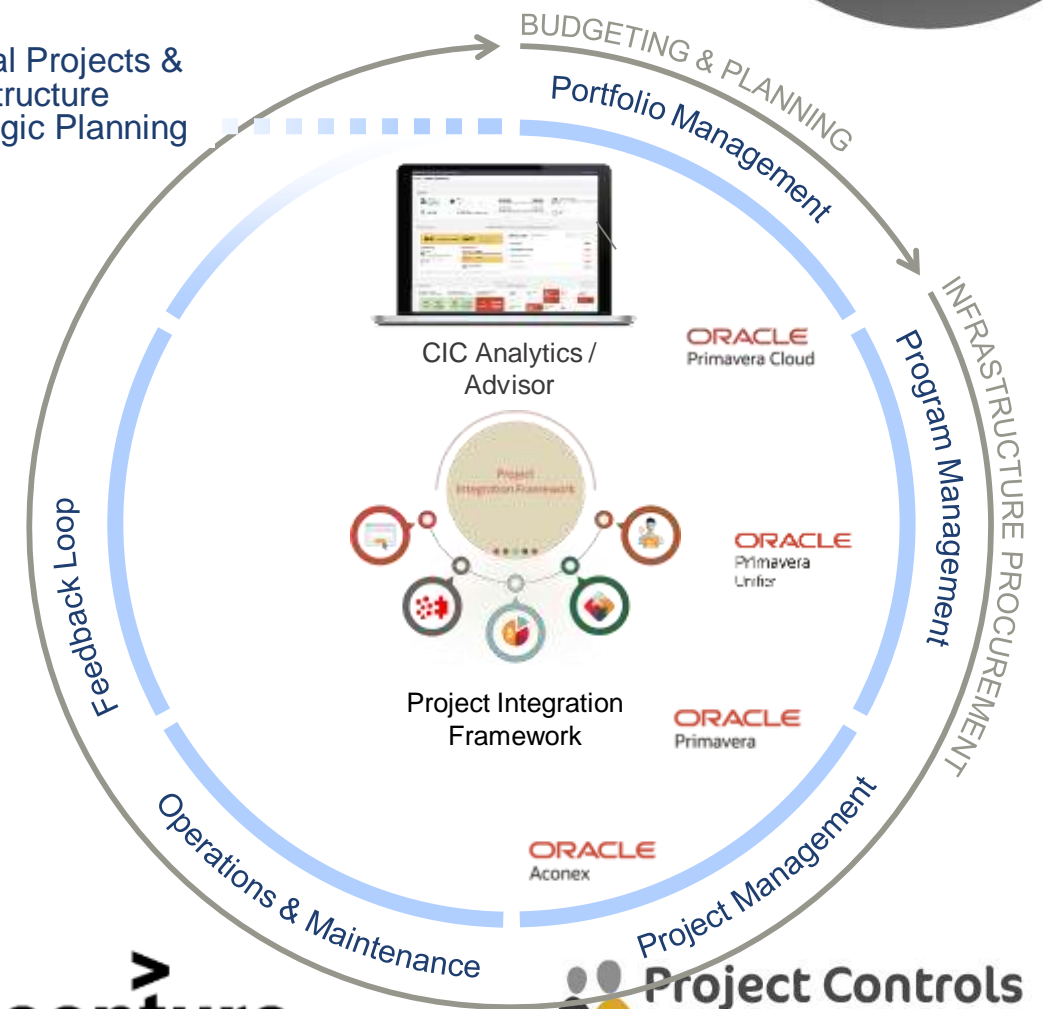
Oracle Partnership

A strategic partnership with Oracle Engineering & Construction Global BU (CEGBU)

Partners, Programs & Awards

- Construction Industry Institute for industry leading practices
- Other vendor partners that compliment CEGBU products
- Certified Oracle CEGBU license reseller
- Oracle CEGBU On Purpose Award for innovative managed service model
- Joint Accenture / Oracle investment programme for Oracle Cloud “Cloud Catalyst”

Capital Projects & Infrastructure Strategic Planning



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Project Controls EXPO
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Methods, Tools & Accelerators

Implementation Methods, Tools & Accelerators to ensure speed & quality delivery

Methods

Iterative implementation methodology for Oracle CEGBU products
With Fast Start reusable implementation artefacts including functional and technical design documents and configuration workbooks for project controls business processes

Tools

Business Process Model for Capital Projects processes with L0 – L6 process flows and capability maturity assessment models

Accelerators

Our own environments of Oracle CEGBU products to develop PoCs
Our own pre-configuration to help establish a quick MVP
Pre-configured project controls dashboards
Integration accelerator for integrating with other 3rd Party applications such as SAP and others

Capability to Deliver

**Dedicated Global Oracle
CEGBU practice joined up
with Industry X with deep
experience & knowledge
with the Industry and related
technologies**



Public Works Client that we helped to create a digital command centre. Publicly launched to show transparency of progress relating to infrastructure delivery of schools and hospitals and other key assets.

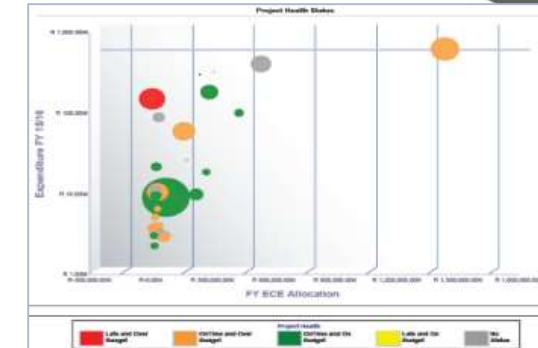


Single Version of Truth



Full portfolio visibility and performance management

NEAR REAL-TIME VISIBILITY INFORMED DECISIONS

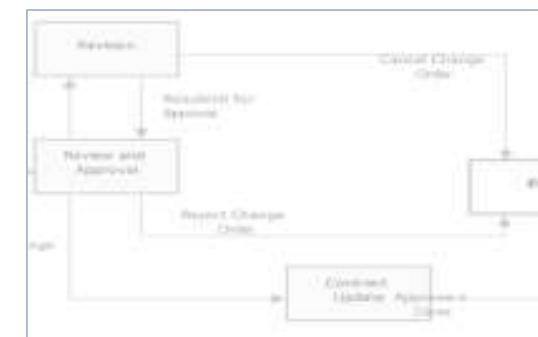


EXPENDITURE CONTROL



Cost, cash flow and variation control and governance

AUTOMATED PROCESSES



Integrated schedule, contract and financials



Connected Project & Portfolio Management

With our cPPM offering we can help organizations to deliver projects more efficiently because we have the experience, methods, tools and accelerators to implement...

An integrated delivery framework

One integrated Solution

Single Version of Truth Analytics

...more quickly, holistically and embedded across the organization.



Delivered by **accenture**
Powered by **ORACLE**
Construction and Engineering



Connected Construction

Offers real-world view of construction progress



What is Connected Construction?

A platform that enables organizations to realize the full potential from their **people, equipment and materials** by connecting them in real-time to improve safety, efficiency and predictive delivery.



Connected Construction offers...



Control Cost and Schedule Better

Proactive actions not reactive. Identify cause of cost over-runs and schedule extensions with real time data. Create early warning systems tied to leading indicators.



Create Smart, Productive Teams

Real time, multi-directional communication between people, systems, assets and management.



Optimize to Avoid Waste

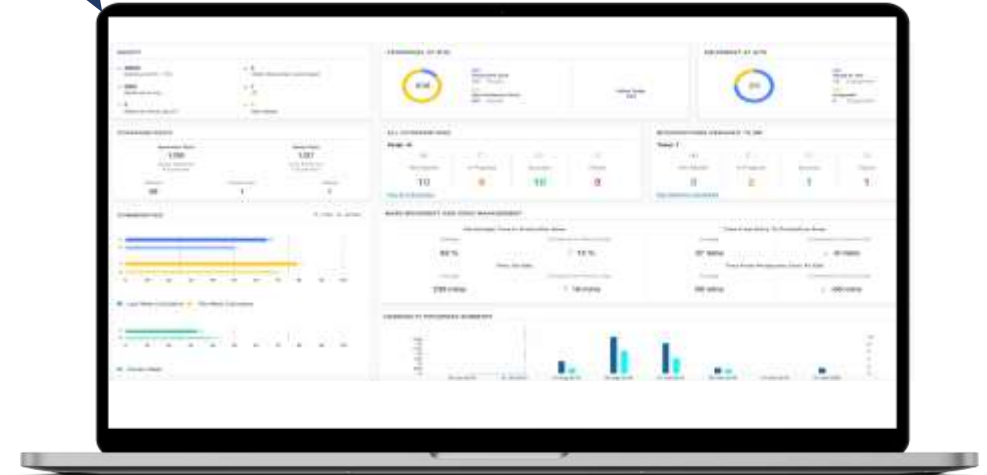
Insight into assets – real time access to capability, location and quantity of people, equipment and materials are key to successful job planning, accurate demand planning and waste avoidance or duplication.



Aid Decision Making with Technology

Modern policies mandate constructors to integrate decision making technology into their work practices without affecting performance or cost.

Microsoft IoT Partner of the Year 2019

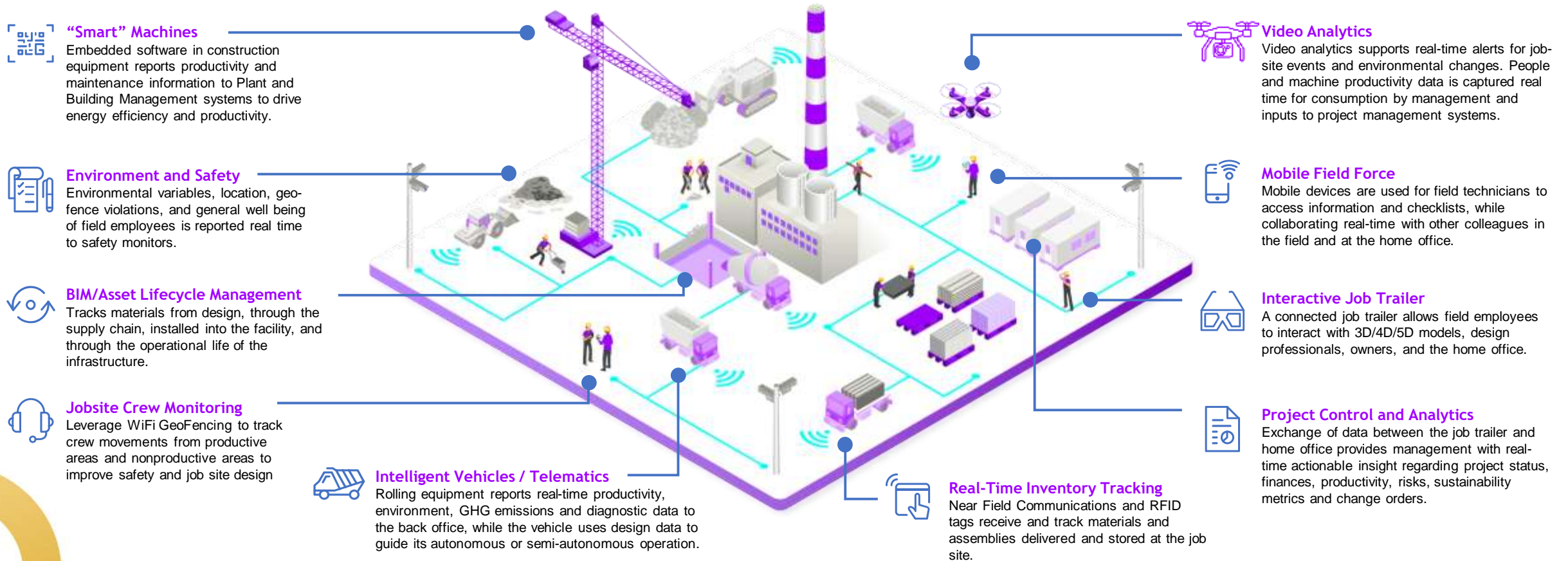



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 **Project Controls**
EXPO
UAE, Middle East

What does a connected construction site look like?

The solution brings together a comprehensive set of functionalities and insights into one platform making construction sites connected, intelligent and collaborative



Value and benefits that it unlocks

	Value Driver	Value Levers	Focus Areas	Typical Benefits
Project Value	Increased Construction Productivity	Increase Productivity	Work Package Optimization Asset Utilization, Digitally Enabled Field Worker Digital Progress measurement	+ Productivity + Schedule Control + Construction Quality + Productivity
		Reduce Downtime	Intelligent Resource Allocation Fully Integrated Teams	- Downtime + Integration of teams, material, etc.
	Reduced Variable Costs	Reduce Construction Costs	Consumables Efficiency Labor Efficiency Digital Progress measurement	- Consumables Costs - Labor Costs - Rework, Errors - Waste and Energy Use - Carbon Footprint
	Increased Capital Efficiency	Improve Construction Asset Utilization	Asset Planning Time on tools	+ Asset Utilization - Maintenance Cost
		Reduced Capital Requirements	Inventory Optimization Spares Optimization	- Raw Material Inventory - Spares Inventory
	Optimise Construction Related Risks	Reduce Asset Risks	Construction Integrity, Predictive Analytics	- Injuries / Deaths / LTI / MTI - Environmental Incidents
		Health & Safety Risk	HSE Work Control, Video Analytics	+ License to operate - Reduced Liability

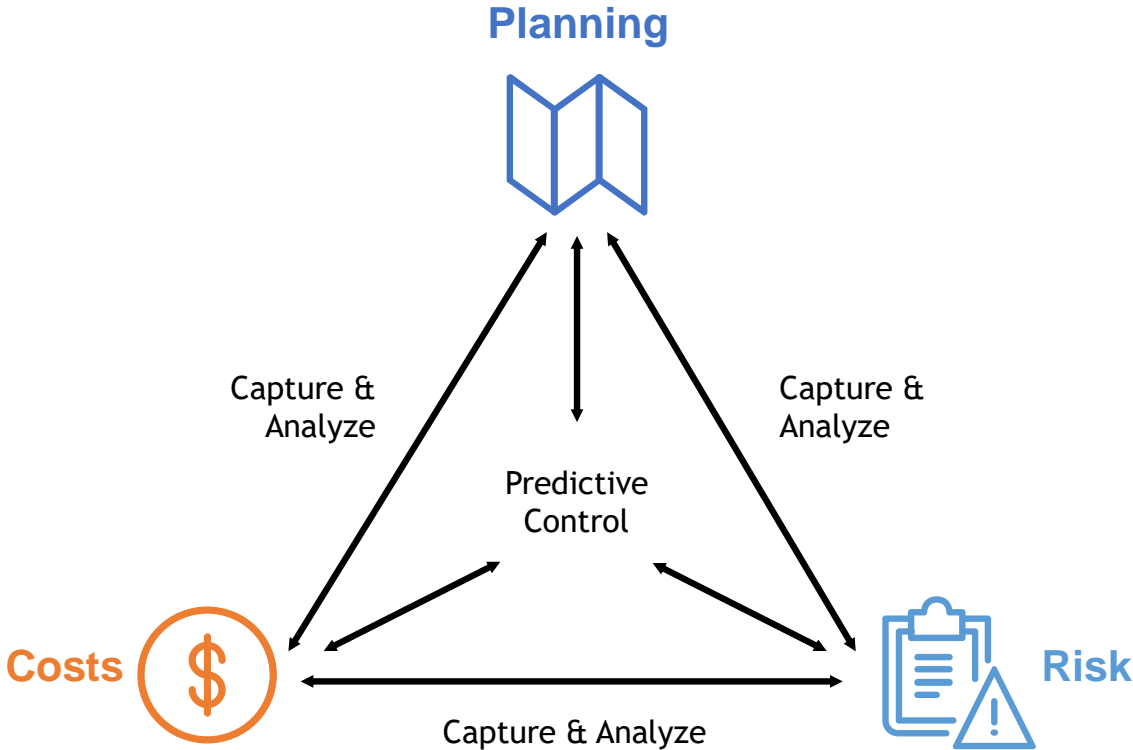
Control Tower

Decision making from the data source



Control Tower

A platform that brings all relevant project data to realize the full potential of that information by connecting it in real-time to improve analysis, insights, predictability and lower GHG emissions

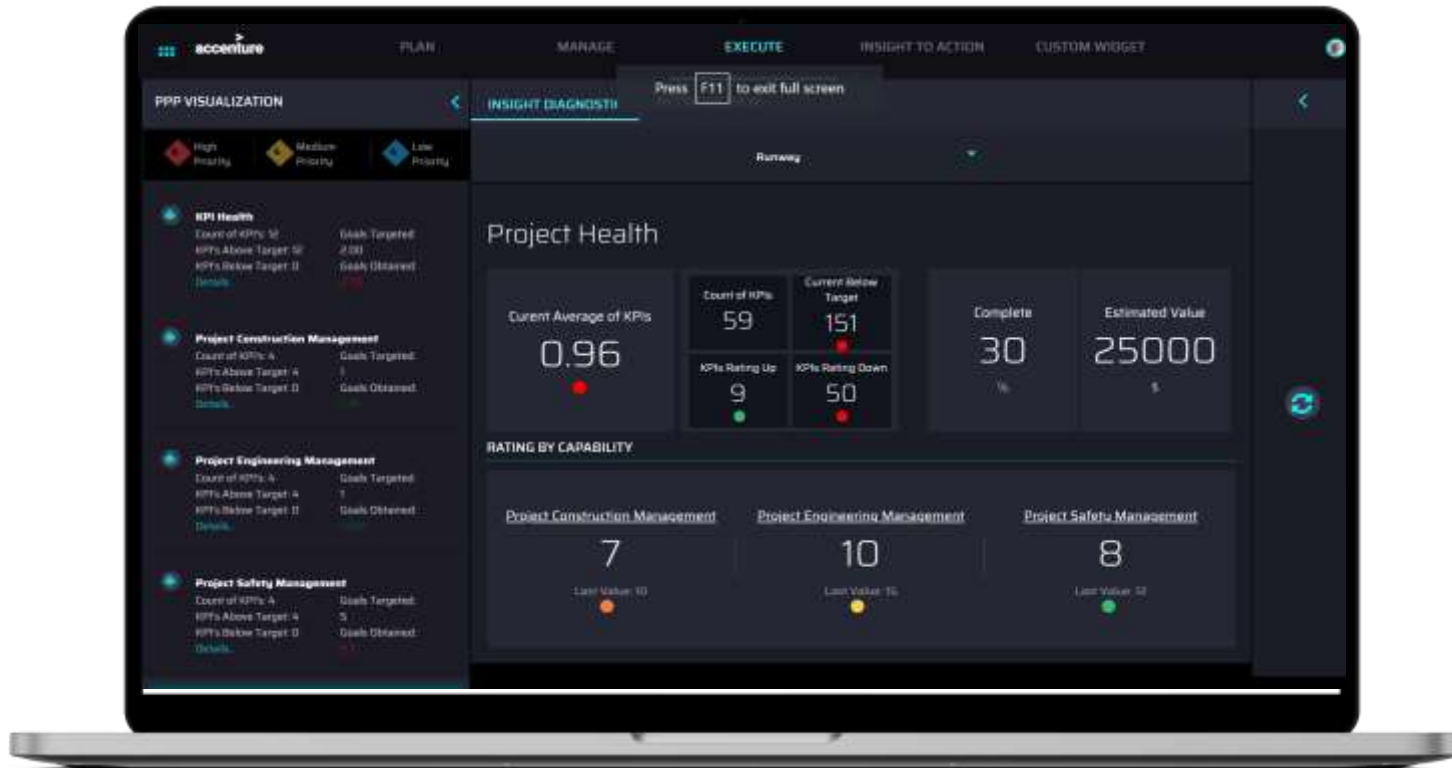


It allows companies to get real-time visibility and enhanced insights from critical data, to improve predictability across the entire project lifecycle, manage changes proactively / effectively, and optimize project delivery; raising workforce productivity and reducing budget overruns and delays.



Control Tower

A single source of truth for engineering, procurement & construction updates to realize the full potential of people, partners, suppliers, equipment, materials and IP.



**Multi-Disciplinary
Single Source of
Truth**

Multiple structures of reporting



**AI-Powered
Decision
Support**

Capture project learning, success and failure paths, and simulate “what ifs..”, etc.



**Benchmarking &
Management**

Define & manage constraints for data driven decision making

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Control Tower offers...

A platform to plan, manage, execute, and optimize all aspects of capital projects, utilizing industry standard project controls and decision support insights.



Asset Breakdown Structure



Insight to Action



Multi-Dimensional Analysis

Project Controls - manage KPIs at all levels

- **Explore Project Structures** - allowing drilldowns at any level (portfolio, program or project)
- **Descriptive Project Health Indicators** - including overall project progress to date plus look ahead

- **Predictive Leading Indicators** - for early identification of EPC trends
- **Planning Simulation, Benchmarking & Optimization**
- **Connectors Tools and Extension Model** - for deeper integrations and company specific requirements



Value and benefits that it unlocks

Control Tower helps to reduce costs, increase capital efficiency mitigate risk and track emissions

	Value Driver	Value Levers	Focus Areas	Typical Benefits
Project Value	Improve Planning & Scheduling	Shorten Schedules	Schedule simulation Crew usage optimization Change management	+ Multiple scenarios + Schedule control + Use of resources + Use of equipment - Reduce Carbon Footprint
		Enhance Planning	Change from manual to generative planning	- Planning effort + Reaction to change
	Improve ROI	Predictable Outcomes	Reduce Project Risk Verifiable progress	+ Visibility + Predictability
		Accelerate Project Completion	Enhanced KPI's Digital progress measurement	- Erroneous payments - Budget Overruns
	Improve Efficiency	Improve Capital Efficiency	Leverage existing assets	+ Asset utilization - Maintenance cost
		Improve Execution Efficiency	Single source of truth Governance model	- Silos - Communication errors - Reduced change orders / claims + Workforce Productivity + Stakeholder Management - Waste and Energy Usage

Sustainability & Circularity in capital projects

Robust Sustainability & Circularity Framework



Sustainability & Circularity Framework

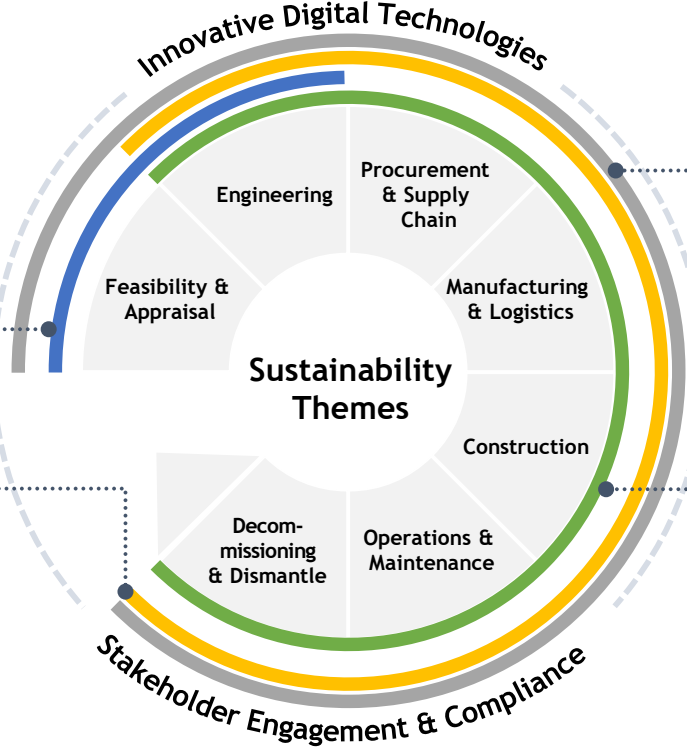
Our capital projects sustainability framework focuses on four core pillars for achieving enterprise' sustainability goals driven by successful execution of capital projects

Effective sustainable design is a comprehensive approach to select & integrate products/processes for building a sustainable infrastructure / asset for long-term environmental conservation.

Design for Future
Optioneering & Sustainable Designs

With the increased focus on reducing environmental impact, Capital Projects can benefit from the growing decarbonization initiatives by viewing ESG as a strategic opportunity and embed in its core processes

Carbon Neutrality
Drive energy & carbon efficiency



Institutional Sustainability
Promote sustainable innovation and growth

Institutional sustainability needs to be evaluated across different jurisdictional scales, aligning global and national strategies and grounding them in sectoral, territorial, and urban development strategies.

Responsible Resource Consumption
Efficient & Effective resource utilization

It is really about an integrated approach across project lifecycle to harness the power of resource optimization & efficiency by bringing in 4R (Reduce; Reuse; Recycle & Recover) philosophy

Enablers

Digital Technology

Digital technology is a true enabler of sustainability by twofold imperative: to use technology more sustainably, and to use technology as a vehicle for being more sustainable

Stakeholder Engagement & Compliance

Stakeholder engagement & integration is a necessity for enablement of a policy, procedure and effective implementation through robust governance



Sustainability & Circularity in Capital Projects

The capital projects solutions are focused on achieving enterprise's portfolio sustainability goals from feasibility to digitally managed construction adhering ESG compliances

Capital Project Lifecycle

- Design for Future
- Carbon Neutrality
- Institutional Sustainability
- Responsible Resource Consumption

Sustainable Project & Portfolio Strategy

Developing sustainable portfolio to achieve enterprise targets and helping them realize through efficient execution models

- Portfolio Assessment ■ ■
- Sustainability Maturity Assessment ■
- Operating Model Design ■ ■
- Sustainability & Circularity Risk Assessment ■ ■

Engineering Design & Project Documentation

Leveraging power of engineering to create sustainable designs, using eco-friendly material and enhance asset lifecycle

- Digital Twin ■ ■
- Generative Design ■ ■ ■
- BIM & 3D Modelling ■ ■
- Engineering Document Management & Collaboration ■ ■ ■

Green Procurement and Material Management

Embedding circularity from sourcing to consumption making supply chain sustainable

- Strategic Supplier Ecosystem Development ■ ■ ■
- Green Sourcing & Logistics ■ ■
- Circular Supply Chain ■ ■ ■

Circular Project Mgmt. & Execution

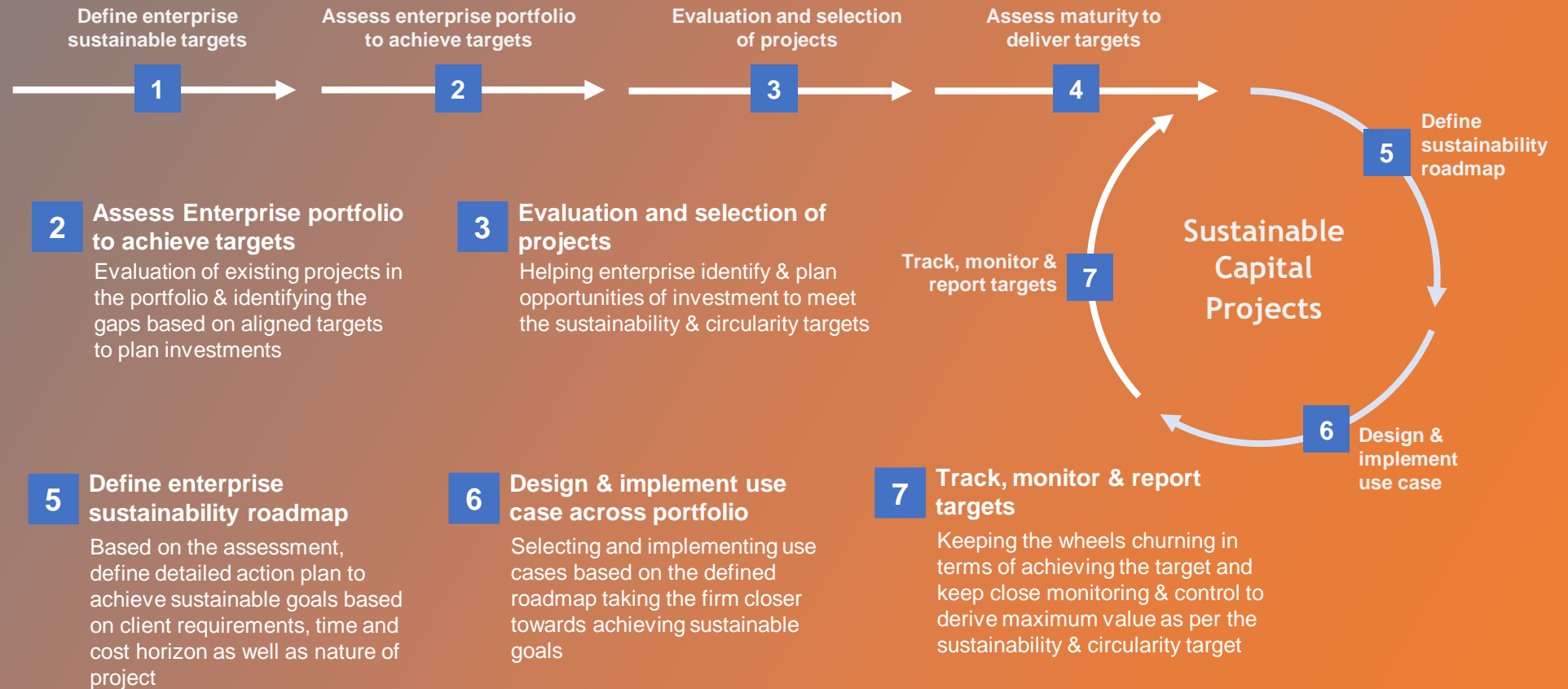
Holistic real time updates enabled by technologies to monitor KPIs, control resource wastage & carbon footprints for the organization

- Connected Construction ■ ■
- Digital Handover ■ ■
- Reduce-Reuse-Recycle-Recover Resources & Energy ■ ■ ■
- ESG Compliance & Monitoring ■ ■



Embedding Sustainability & Circularity

Our Approach



A case for increased *resilience* in *capital infrastructure*



Investing early to make built environments more *resilient* and erecting them in more *secure locations* are crucial ways to *save lives, minimize costs, and protect development investments.*

[Worldbank.org](https://www.worldbank.org)



What is *capital infrastructure resilience*?

Adapting to changing policy, market and technology associated with the low carbon transition, as well as physical climate impacts.

Task Force on Climate-related
Financial Disclosures (TCFD)

Climate Risk

Carbon Emissions

Energy Usage

Structural Resilience

Socio- Economic Risk



Grid Resiliency Index (GRI)

The Challenge: Increasing frequency and severity of extreme weather events are posing a greater risk to aging assets. In addition, a greater focus on social responsibility to customers, and a changing regulatory environment, demands that asset owners think along many different dimensions when developing their capital investment strategy.

GRI is a comprehensive suite of physical risk analytics to:

- **Evaluate asset-level climate risk**
- **Integrate community vulnerability**
- **Plan capital investment strategies**



Powerful Visualizations

Ability to visualize and prioritize the most vulnerable areas in the service territory



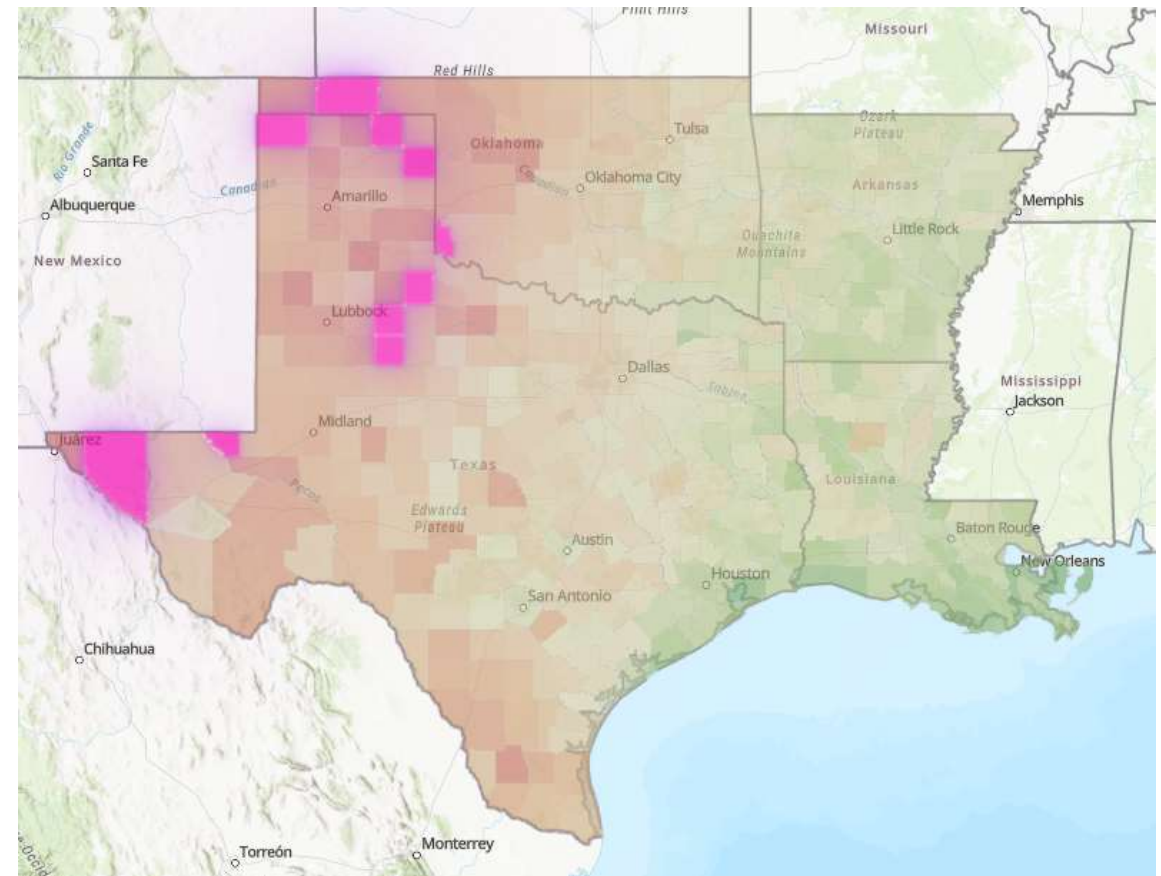
Platform Agnosticism

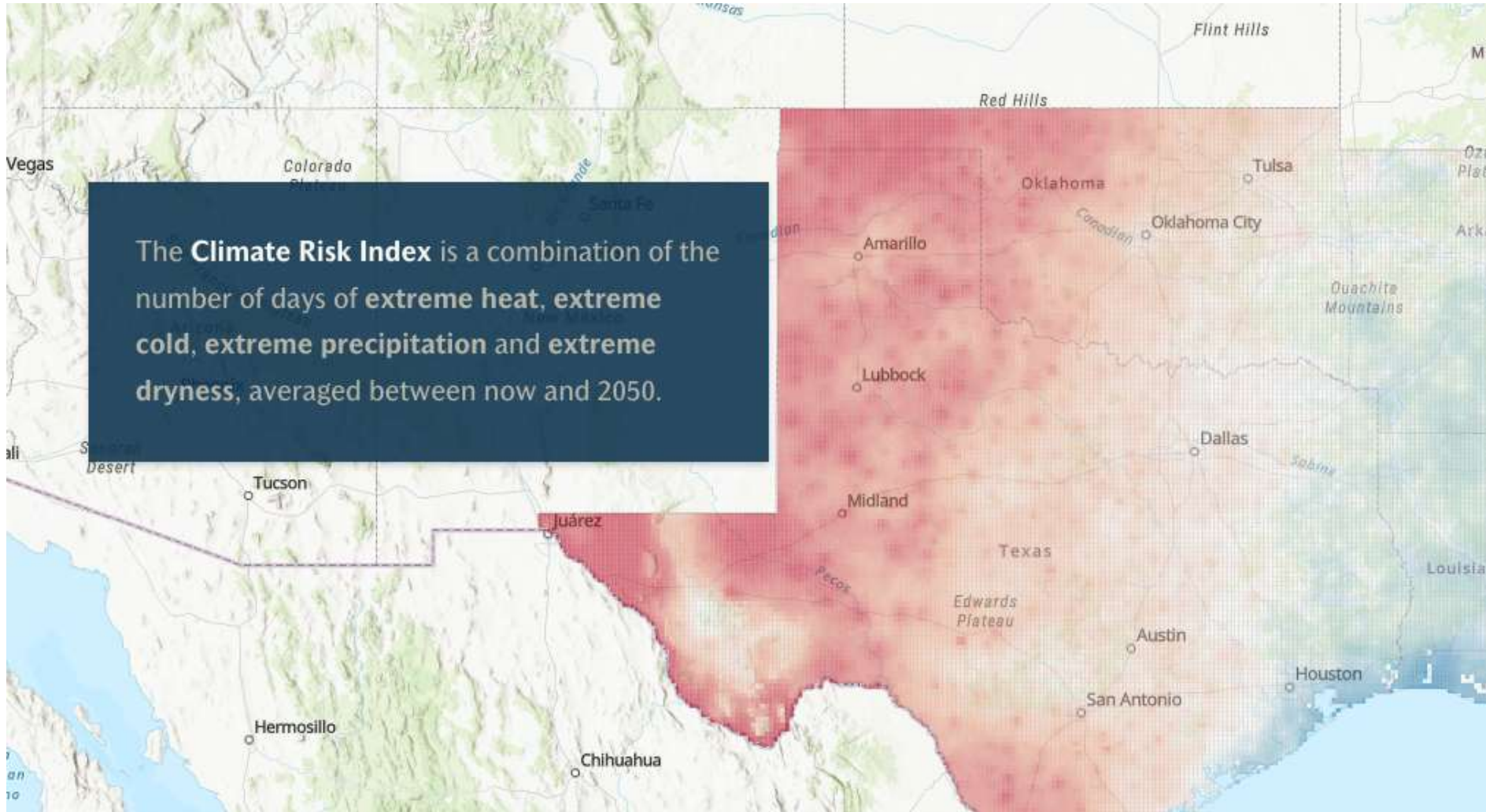
Methodology is highly configurable, built using Python and ArcGIS



Advanced Data Analytics

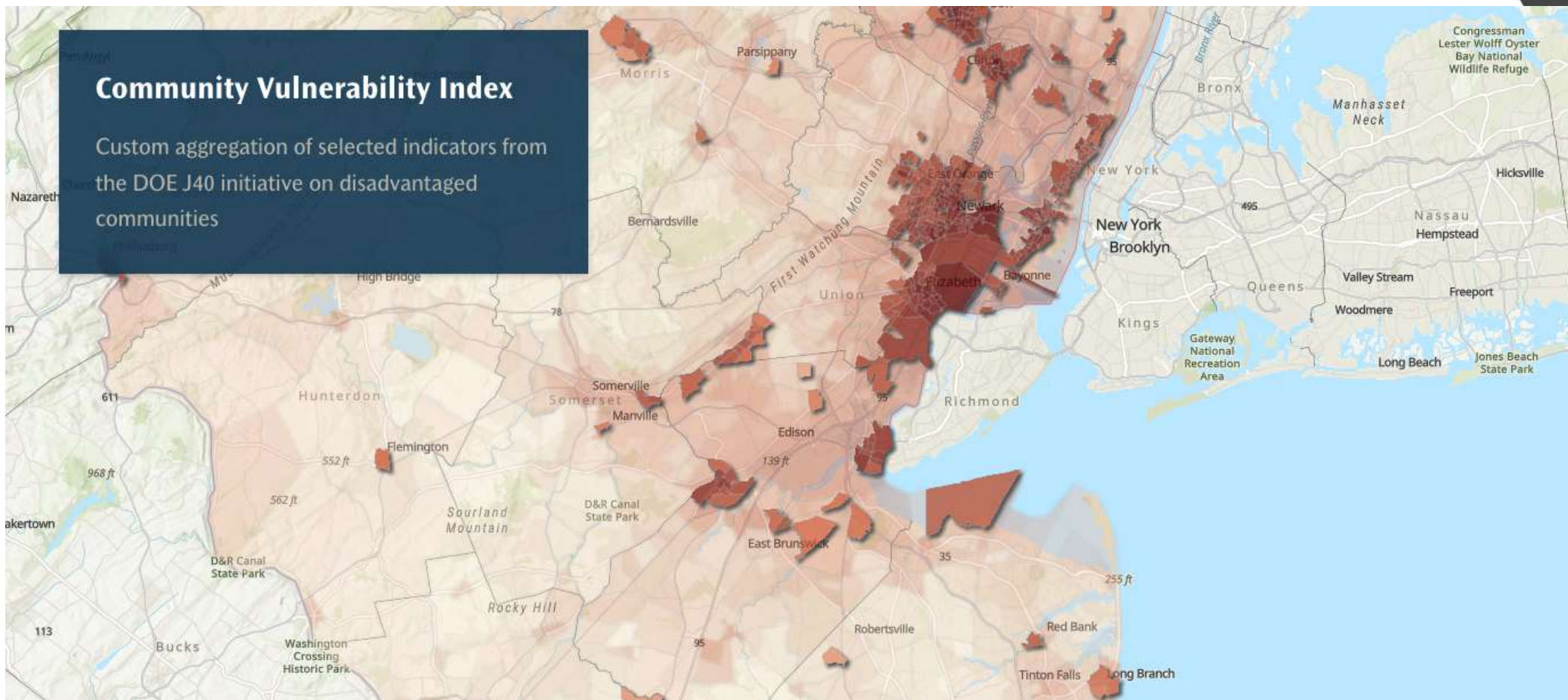
Integrates utility asset data with climate, socio-economic and geospatial data

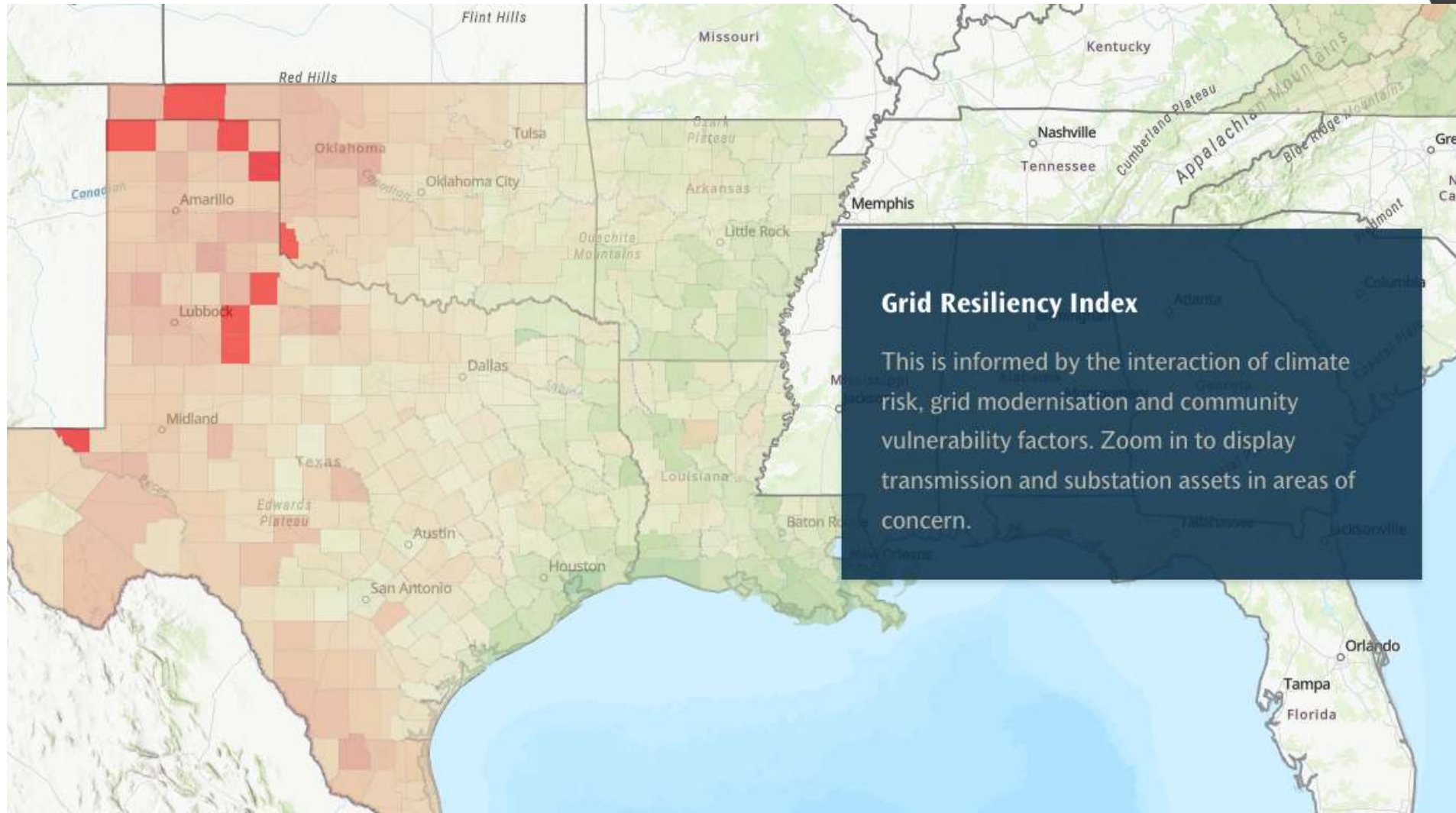




Community Vulnerability Index

Custom aggregation of selected indicators from the DOE J40 initiative on disadvantaged communities







THANK YOU

Your Company Logo