

A guide · The $500 trillion PPP infrastructure opportunity

Launch a PPP program for Heritage and Antiquities Institutions in Jordan

WHAT THIS GUIDE IS FOR

Your institution launches a PPP program to build and run visitor centers, museums, conservation labs, digital records and heritage trails as public-private partnerships (PPPs), with conservation first, starting with Jordan's $86 billion and Aqaba's $46 billion of projects.

PREPARED FOR
Heritage and Antiquities Institutions in Jordan

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INTRODUCTION

A century of infrastructure reaches the end of its useful life

Most of the roads, bridges, power plants, water networks, ports and airports the world runs on were built in the last hundred years, and much of that stock is wearing out at the same time.

The infrastructure of the twentieth century was designed, poured and left to age. It carried the growth of every modern economy, and it was built for a world with fewer people, far less data and a different climate. Pipes leak, grids strain under new demand, and assets designed for one purpose are asked to carry several. Replacing them is the largest building program in human history, and it has already begun.

Rebuilding and running the world's infrastructure will take about $500 trillion over the next fifty years. It is the largest investment humanity will make in that time. Public-private partnerships (PPPs) will carry a large share of it, because governments cannot fund, build and run the rebuild alone, and the private sector cannot do it without them.

How the $500 trillion adds up

	$300T	to build the physical assets: roads, rail, ports, grids, water, cities, schools and hospitals
+	$150T	to operate and maintain them across the life of each concession
+	$50T	for the sensors, compute and robotics that will sit inside them, the share of the rebuild that venture capital can fund
=	$500T	**in total to rebuild and run the world's infrastructure over the next fifty years**

INTRODUCTION

The next hundred years will build Earth's largest computer

For thousands of years the method has stayed the same: design it, pour it, forget it, and repair it when it fails. The next generation of infrastructure will carry a software layer specified alongside the concrete. Assets will monitor their own condition, predict their own failures and schedule their own maintenance, and fleets of machines will raise them with very few human hands involved.

The larger change is the connection between assets. When a port knows what the rail line is carrying before it arrives, a water utility prices its pumping energy against the grid in real time, and every contract and drawing on every project sits in one connected record, the built world starts to behave as one system. Joined across borders, the world's roads, grids, ports, water networks, data centers and satellites become one globally connected, superintelligent computer.

Future infrastructure will be self-building, self-monitoring and self-healing. A road that senses its own cracks can schedule its own repair and use the savings to fund the next stretch. A water network that finds its own leaks can put the recovered water into meters on the next street. Each asset leaves behind the money, the data and the proof for the asset that follows it, so each new project starts further ahead than the last.

The point where the built world starts improving itself faster than anyone can direct it is the infrastructure singularity. Three technologies bring it closer: artificial intelligence designs and runs the assets, robotics builds and maintains them, and tokenization finances them and opens their ownership to everyone. Heritage is where the three can record and protect what no project can rebuild. AI reads scans and site images, drones and robots capture monuments in three dimensions, and tokenization lets visitors fund the places they come to see.

Heritage sites and museums have long been funded by public budgets, grants and entry fees, and the visitor centers, labs and services around them have often been built one at a time. The heritage sites of the next fifty years will be documented, conserved and presented with partners who invest in them, and the institutions that set up those partnerships now will decide how conservation is funded for as long as the contracts last. This guide invites heritage and antiquities institutions in Jordan to launch a PPP program, starting with the projects at home.

THE GUIDE

Protect the past with the $500 trillion PPP infrastructure opportunity

Your institution opens a dedicated PPP program, a team and a set of offers that build and run visitor centers, museums, conservation labs and heritage trails under long concessions, starting with Jordan's $86 billion of projects and the $46 billion anchored in Aqaba.

01 **A PPP heritage team.** A dedicated team that knows how PPPs are prepared, procured and financed follows every tourism, road, water and urban project in Jordan's pipeline from the first market sounding and decides early where heritage sites can gain or need protection.

02 **Visitor centers and museums.** Visitor centers, site museums, ticketing and services at places such as Petra, Jerash, Umm al-Jimal and As-Salt can be run by private operators under concessions that keep the monuments and collections under public control and share revenue with conservation.

03 **Conservation labs and digital records.** Conservation laboratories, collection stores and 3D scanning of monuments can be financed and run by a partner and paid by performance, so every site gains a detailed digital record and the care that keeps it standing.

04 **Heritage-led direct proposals.** Jordan's PPP Law No. 19 of 2023 accepts direct private proposals under Article 15. A heritage institution can receive and invite proposals from companies, such as a visitor center, a heritage trail or a scanning program, and review each one against the site's conservation plan.

05 **Pilots as small-scale PPPs.** PPP Regulation No. 9 of 2024 defines small-scale PPPs below $14.1 million, which can be bundled into one feasibility report and one tender. A visitor center for one site or a scanning program for a group of monuments at that scale gives the institution a live concession and a reference.

JORDAN AND AQABA

An $86 billion pipeline to start with

Jordan has 243 PPP and infrastructure projects in development, worth about $86 billion, of which $46 billion is anchored in Aqaba. Many of them, from roads and water lines to hotels and urban renewal, will be built on or near land that holds Jordan's antiquities.

$86 billion
of PPP and infrastructure projects in development across Jordan

$46 billion
anchored in Aqaba, Jordan's only port and its gateway to the Red Sea

SECTOR	PROJECTS	VALUE	WHAT THE PROJECTS WILL BUY
Energy	33	**$28.3 billion**	Grid and demand forecasting, solar and storage analytics, robotic panel cleaning, predictive maintenance
Tourism	40	**$13.8 billion**	Visitor flow and demand forecasting, resort and heritage-site operations, booking and payment rails
Urban development	17	**$13.8 billion**	Digital twins of new districts, digital permitting, modular construction, district operations
Transport	33	**$11.7 billion**	Traffic and fleet AI, tolling and payments, inspection drones for roads and rail
Industry	31	**$8.1 billion**	Factory automation, quality verification, industrial sensors and energy management
Water	29	**$7.6 billion**	Leak detection, pressure management, smart metering, pipe-inspection robots
Mining	15	**$1.2 billion**	Autonomous drilling and haulage, drone surveying, ore sorting
Health	12	**$1.0 billion**	Hospital operations AI, patient flow, equipment monitoring
Agriculture	10	**$310 million**	Precision irrigation, farm robotics, crop and soil monitoring
Environment	15	**$270 million**	Waste-sorting robotics, emissions monitoring, circular materials
Digital	6	**$270 million**	Data centers, connectivity, sovereign compute
Education	2	**$20 million**	School and training campus PPPs, digital learning, building operations and energy retrofits

A Jordanian heritage institution that runs one site concession at home can carry the same model to heritage sites across the region. Aqaba concentrates ports and terminals, logistics, rail to the port, industry, energy, water and tourism inside the Aqaba Special Economic Zone, which makes it a single place to test port automation, logistics software, desalination and energy technology on assets that connect Jordan to the world.

SECTOR GUIDES

Jordan's $86 billion, sector by sector

Jordan is investing in and advancing 23 sectors at once, and together their projects make up the $86 billion. A sector guide for each lists every project in it, its link to the infrastructure singularity and the ways a partner can take part.

The sectors closest to heritage and antiquities institutions

Tourism	PDTRA develops the Petra region for tourism and manages the Petra Archaeological City. 56 projects, $13.8bn of forward investment. www.JordanPPP.com/sectors/tourism
Creative Industries	Department of Antiquities permits events and festivals at archaeological sites. 14 projects, $47m of forward investment. www.JordanPPP.com/sectors/creative
Urban Development	PDTRA handles land organization, real estate and investment around Petra. 30 projects, $12.8bn of forward investment. www.JordanPPP.com/sectors/urban
Education and Skills	DoA museums (Jordan Museum of Archaeology, Umm Qais) and UNESCO heritage training. 12 projects, $7m of forward investment. www.JordanPPP.com/sectors/education
Transport	Amman railway station hosts the Hejaz Railway museum and heritage train trips. 32 projects, $8.1bn of forward investment. www.JordanPPP.com/sectors/transport

All 23 sector guides

Oil, Gas and Power	$15.1bn	Wastewater and Reuse	$946m
Tourism	$13.8bn	Nuclear Energy	$835m
Urban Development	$12.8bn	Agriculture and Food	$400m
Green Hydrogen	$10.6bn	Solar Power	$326m
Transport	$8.1bn	Digital and AI	$243m
Water	$6.7bn	Circular Economy	$189m
Fertilizers and Chemicals	$6.5bn	Wind Power	$186m
Ports and Logistics	$3.6bn	Pharmaceuticals	$128m
Manufacturing	$2.4bn	Creative Industries	$47m
Storage and Grids	$1.4bn	Defense	$10m
Mining and Minerals	$1.2bn	Education and Skills	$7m
Health	$986m		

Every sector guide can be read and downloaded at www.JordanPPP.com/sectors.

ARTIFICIAL INTELLIGENCE

AI designs, structures and runs it

A PPP takes about seven years from concept to financial close and costs roughly 10% of capex to structure. Almost all of that work is documents and models, which is the work AI does well.

What changes

When the cost of intelligence approaches zero, the cost of preparing a project falls with it. Feasibility studies, options appraisals, cost plans, risk matrices, financial models and tender documents can be produced and tested in days, and contracts can be drafted and stress-tested in hours. PPP projects will soon appoint an AI technical advisor alongside the human ones. Once an asset is running, the same intelligence operates it: a digital twin models the asset in real time, sensors report wear and faults early, and maintenance follows the data.

Jordan arrives late to PPP software, and that is an advantage. With few legacy systems to migrate off, AI-native tools can be built from the ground up, and the reasoning behind each decision can be captured inside the transactions being structured today.

What it means for heritage and antiquities institutions

AI can watch over heritage sites across a whole country. It can compare scans and satellite images over time, spot cracks, erosion, looting and encroachment early and forecast visitor numbers at every gate. A heritage institution can use those tools to protect more sites with the same staff and to show partners what each concession achieves.

What will be built

Project preparation	Software that turns feasibility studies, cost plans and tender documents into a repeatable process, so the years spent before tender shrink to months.
Procurement	Tools that let ministries compare bids on whole-life cost and deliverability.
Cost estimation	A national benchmark database that prices every project against real Jordanian rates.
Contract intelligence	Assistants that read, compare and answer questions on every contract, drawing and instruction on a project in plain language.
Asset monitoring	Sensors and digital twins that tell an operator what will fail before it fails.
Permits and approvals	Digital workflows that replace the paper trail across ministries, municipalities and utilities.

ROBOTICS

Robots build it and keep it running

Most of the $500 trillion of infrastructure due over the next fifty years will be built by machines, and people will design, train and supervise those machines.

What changes

Autonomous software combined with autonomous machines produces autonomous infrastructure. Tunneling machines, construction robots, drones and modular factories already raise structures with far fewer people on site. The machines then stay with the asset: drones inspect bridges and power lines, robots travel inside pipes to find leaks, and cleaning robots keep solar fields at full output.

Robotics also changes who can compete. A small company with the right machines can build what once needed a thousand-person contractor, and it can prove its method on a pilot before anyone asks for a track record, which opens PPP work to new companies for the first time.

What it means for heritage and antiquities institutions

Laser scanners, drones and robotic rigs can record monuments, tombs and inscriptions in three dimensions and survey cliffs and excavations that people cannot reach safely. A heritage institution can use the same tools to monitor stone, water and structural movement, and train young people from nearby towns to fly the drones, run the scanners and repair them.

What will be built

Water networks	Robots and acoustic sensors that find leaks inside the network, in a country that still loses about 41% of its water to leaks, theft and faulty meters.
Construction	Modular methods, on-site automation and quality verification suited to Jordan's labor market.
Inspection	Drones and crawlers that survey roads, bridges, rail, power lines and pipelines and report defects automatically.
Energy	Robotic cleaning and maintenance for solar fields, and retrofit technology for public buildings, street lighting and water pumping.
Mining	Autonomous drilling, haulage and drone surveying for phosphate, potash and new mineral projects.
Ports and logistics	Automated handling, yard robotics and drone delivery for Aqaba's terminals and Jordan's dry ports and border crossings.

TOKENIZATION

Tokenization finances it and opens its ownership

A PPP absorbs capital over four years and releases it over thirty. Today's investors expect to enter and exit easily, and tokenization gives them that option.

What changes

A concession is a long-dated, contracted, inflation-linked cash flow, the kind of asset a token represents well and an ordinary investor has rarely been able to hold directly. Tokenization lets a small pilot be funded by a few hundred investors, with returns paid automatically from the asset's own revenue and no lender between them.

The rails already exist in the region. ADGM regulates tokenized securities, the Dubai Land Department records tokenized title deeds on its own register, and Jordan adopted a national Blockchain Technology Policy in December 2024. Tokenized concession revenues are still rare, so the first tokenized PPP in Jordan is open to whoever builds it.

PPP companies will be tokenized before PPP projects, because a developer already gathers projects, risks and revenues into one entity. People will own the builders first, then the portfolios, then the projects, and at the end of that sequence sits a stock exchange for the physical world.

What it means for heritage and antiquities institutions

Tokenization can let visitors and investors fund the places they come to see. Stakes in a visitor center or a conservation program can be offered as tokenized notes, paid from ticket revenue and concession fees, and each token can record the monuments scanned and the conservation work completed.

What will be built

Issuance	Compliant token issuance for PPP companies, infrastructure funds and small pilots.
Investor onboarding	Identity checks, suitability and custody built for Jordanian and regional investors.
Revenue distribution	Smart contracts that pay holders from tolls, tariffs and availability payments as the money arrives.
Registries	Shared records of contracts, milestones and asset performance that every party can trust.
Secondary markets	Venues where holders can buy and sell stakes in operating infrastructure.
Citizen participation	Tools for citizens to propose projects, vote them up and invest small amounts in what gets built.

SMALL PPPS IN PARALLEL

A thousand small PPPs teach more than one large one

The World Bank counted 315 private infrastructure projects reaching financial close across all low- and middle-income countries in 2024, only a few per country. No country can learn quickly at that pace, and each lesson arrives years after the technology behind it has moved on.

Each of those projects is too large, too slow and too expensive to try anything new on, and every approval, guarantee and stakeholder on a $1 billion project pulls it toward the way things were done before. Small projects are where a new idea can afford to be wrong, because the downside is small, the learning cycle is fast and the bureaucracy is thin.

Run them in parallel

Software has already moved from building one idea at a time to building ten at once, and infrastructure can follow. Picture 100 small schools built within six months, each delivered through its own PPP and each testing a slightly different legal structure, financing model, construction method and operating approach. Performance data arrives quickly, the models that work are copied, the weak ones are retired early and policy improves with every round, so a thousand small projects teach a country tens of thousands of lessons where one large project teaches a few.

$10M	spent preparing a single $100 million PPP, enough to build 100 pilots at $100,000 each
780	small PPPs a year in Jordan at $100,000 each, from 1% of the budgets of its 40 contracting authorities, about $78 million, in a country that closes only a handful of PPPs a year today
97,500	small PPPs a year if every country ran 500 at $100,000 each, for $9.75 billion, less than the price of one metro line

The PPP singularity

The PPP singularity is the point at which it becomes cheaper to build the pilot than to conduct the study. One feasibility study can make a project look feasible, another can make it look unfeasible, and the decision still comes down to judgment, while a pilot settles the argument with evidence. Governments that work this way become portfolio managers of experimentation: they set the objectives and the guardrails, standardize contracts that can adapt, collect the data and publish every pilot, every cost and every failure on one public website.

PPP RESEARCH LABS

Pilots need somewhere to live

PPP innovation needs the public and private sectors working together, so each lab is built the way a PPP is built: the public sector spearheads it and the private sector designs, finances, builds and operates it.

One lab per sector	Water, power, transport, aviation, health, education, agriculture, digital, tourism and urban development each get a lab inside the ministry or authority that runs the sector.
A one-line brief	Run ten small PPP projects a year at up to $100,000 each, testing new technologies, new PPP frameworks, new construction methods and new financing structures.
A PPP itself	The ministry tenders the lab, and private companies bid to design, finance, build and operate it with their own capital, effort and technology.
Funding	About $1 million a year per lab, found by moving 1% of an authority's budget away from inefficient spending. Ten labs can run a hundred experiments a year on a modest budget.
Open results	Every result is published as it happens, including the failures: what worked, what failed and what the contract should have said. The lessons go straight into the large PPPs already running and the ones still to come.
Room to explore	Labs carry no fixed deliverables, because predetermined outputs defeat the purpose of research, and they are judged on engineering results.

Who builds and who funds

Small projects open PPPs to founders and small companies. On a large concession a bid costs 3% to 5% of capex, prequalification asks for a decade of comparable projects and performance bonds run to tens of millions. AI cuts the bid cost, robotics cuts the crew a project needs and tokenization lets a few hundred investors fund a pilot, so a small PPP moves at the speed of the founders running it. Venture capital funds the technology, infrastructure funds finance the assets, and a $10 billion fund raised by both, deploying $2 billion in its first year, could back 20,000 small PPPs, about 100 in every country.

What it means for heritage and antiquities institutions

Small PPPs let a heritage institution prove a new model at one site at low cost. It can host a PPP research lab that trials 3D scanning, AI condition monitoring and digital guides, publish every result and carry the pilots that work to heritage sites across Jordan.

UNSOLICITED PROPOSALS

Jordanian law accepts unsolicited PPP proposals

Any private company can take its own PPP idea to government. Article 15 of PPP Law No. 19 of 2023 lets a proposer submit a direct proposal to the Ministry of Investment or a public authority, and PPP Regulation No. 9 of 2024 sets out how it is assessed.

How a direct proposal works

Conditions	The proposal offers an innovative solution for a public service, is prepared on the proposer's own initiative, gives value for money, fits government programs, covers the government's obligations from project revenues and discloses any conflict of interest.
Contents	The scope, the proposer and its experience, a pre-feasibility study with the innovation and intellectual property behind it, the fiscal implications and any support or guarantees sought, and the cost of preparing the study.
Review	A public authority or municipality that receives a proposal refers it to the Ministry, which has 60 days to take it up for study or return it unopened, and can charge a study fee of at least $7,050.
Registry	A qualifying proposal is listed as a PPP project in the national registry of public investment projects, and one that falls short is rejected.
Tender	If the project goes to tender, the proposer can match the best offer, and if another bidder wins, the winner repays the proposer's direct study costs.
Small projects	Projects with a capital cost below $14.1 million are small-scale PPPs, and similar ones can be bundled into one feasibility report and one tender under simpler procedures.

Limitless ideas

This is the Swiss Challenge approach: the proposer brings the idea, the market competes on it and the proposer keeps the right to match the best offer. Many of the projects in Jordan's $86 billion pipeline are still early enough for a partner to shape the deal or bring its own idea, and a direct proposal can be as large as a mini city built and operated under one contract or as small as a $100,000 pilot. The PPP research labs can be proposed the same way, and every company with an idea for a public service becomes a possible project sponsor.

What it means for heritage and antiquities institutions

Direct proposals let companies bring a visitor center, a heritage trail or a scanning program to a site as their own project. A heritage institution can invite them, review each one against its conservation plan and keep the proposer's right to match the best offer at tender.

WHY HERITAGE AND ANTIQUITIES INSTITUTIONS

Heritage institutions guard what every visitor comes to see

Jordan's monuments, museums and collections draw visitors from around the world and support the towns around them. The visitor centers, labs and services at a heritage site suit the long contracts of a PPP, where a partner builds and runs them and part of the revenue pays for conservation.

Where heritage institutions fit in a PPP

Preparation	Archaeological surveys, site records and conservation plans that set the limits for every project near a heritage site.
Tender	Concession rules that protect the monuments, employ local people and fund conservation.
Financial close	Visitor center and museum finance backed by ticket revenue and concession payments.
Operation	Inspectors, conservators and monitoring that keep each concession within its conservation plan.
Exit	Stakes in operating visitor centers that impact funds and tokenized note holders can buy.

Jordan's heritage is known around the world

Seven Jordanian sites are on the UNESCO World Heritage List, from Petra to Umm al-Jimal, inscribed in 2024. The Department of Antiquities, founded in 1923, protects sites under Antiquities Law No. 21 of 1988 and launched MEGA-Jordan, a national digital inventory of archaeological sites, in 2010.

Why a program, and why now

Roads, hotels, water lines and new neighborhoods are being planned across Jordan, and many will pass close to antiquities. A program gives a heritage institution a team, a pipeline and the partners to act first, and the institution that writes the rules for the first heritage concessions will set the standard for the rest.

THE PROGRAM

How the program could work

The program can sit inside the institution's conservation, museum and site teams, with a PPP lead at its center and offers built from the sites, collections and records it already holds.

PPP team	A small team of archaeology, conservation, tourism, legal and finance people that covers every relevant PPP in Jordan's pipeline.
Visitor centers	Visitor centers, site museums, ticketing and site services run by partners under strict rules for the monuments.
Conservation labs	Conservation laboratories and collection stores financed and run for the institution by performance.
Digital records	3D scanning, digital twins and AI monitoring of monuments, funded from visitor revenue and partners.
Heritage trails	Trails, signage, guiding and transport that link sites and spread visitors across towns and seasons.
Direct proposals	Heritage projects proposed under Article 15, including small-scale PPPs below $14.1 million.
Partners	Agreements with tourism operators, municipalities, universities, museums, banks and impact funds.

What the institution gains

The institution gains steady concession revenue that pays for excavation, conservation and research, partners who finance the visitor centers and labs it needs and jobs for the communities around every site.

It also gains a stronger voice in how Jordan grows. The institution that writes the rules for building near antiquities will shape where roads, hotels and water projects go, in Jordan and across the region.

ABOUT

Jordan PPP

Accelerate Jordan
Accelerate the infrastructure singularity
Accelerate the Jordan PPP singularity

AMMAN, JORDAN WWW.JORDANPPP.COM

Jordan PPP helps every kind of organization in Jordan launch a public-private partnership (PPP) program of its own. It publishes 96 guides, one for each kind of organization, from the Royal Hashemite Court and Parliament to banks, contractors, universities, humanitarian organizations, companies in twenty-one sectors and organizations in twelve governorates.

Its vision is the infrastructure singularity, when roads, grids, ports and water networks become one globally connected, superintelligent computer, built by robotics, run by artificial intelligence and financed by tokenization. Rebuilding and running the world's infrastructure will take about $500 trillion over the next fifty years.

Its method starts small: a PPP program for every organization, small PPPs run in parallel, a research lab in each sector and direct proposals under Article 15 of PPP Law No. 19 of 2023, starting with Jordan's $86 billion and Aqaba's $46 billion of projects.

JORDAN PPP

What Jordan PPP offers

The guides

One for every organization

96 guides, each with the case, the program and six first steps.

www.jordanppp.com/guides →

The summary

All guides in one document

Every guide, its organization and its ask, in one place.

www.jordanppp.com/summary →

Futureproofing

AI, robotics, tokenization

What the three technologies change for every organization.

www.jordanppp.com/futureproofing →

The opportunity

$500 trillion

The $500 trillion PPP infrastructure opportunity, from the crisis to the exchanges.

www.jordanppp.com/opportunity →

NEXT STEPS

How a heritage institution can start

Any heritage or antiquities institution in Jordan can take this guide forward. The first steps use the sites, collections and specialists it already has.

Mandate	Leadership approval for a PPP program, with its services, its sites and its first-year goals.
Team	A named program lead, with archaeology, conservation, legal and finance people drawn from the institution's existing teams.
Pipeline	A map of Jordan's $86 billion of projects by sector and stage, and the projects that will be built near heritage sites.
Sites	A plan for visitor centers, labs, digital records and trails at the first sites, with the limits each monument must keep.
Partners	Tourism operators, municipalities, universities, museums, banks and impact funds.
Pilot	A first visitor center, scanning program or direct proposal invited from companies, taken from idea to submission.

Jordan has the monuments, the visitors and a law that lets companies propose their own projects. A PPP program puts your institution at the center of how the superintelligent infrastructure future protects Jordan's heritage.

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