

A guide · The $500 trillion PPP infrastructure opportunity

Launch a PPP program for Utilities and Operators in Jordan

WHAT THIS GUIDE IS FOR

Your company launches a PPP operations program to bid for operation and maintenance contracts and full concessions in water, power, transport, ports and waste, run with AI and robotics, starting with Jordan's $86 billion and Aqaba's $46 billion of public-private partnership (PPP) projects.

PREPARED FOR
Utilities and Operators 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. Each of the three changes how infrastructure is operated and maintained, and operators carry that work every day.

Operation and maintenance accounts for about $150 trillion of the rebuild and runs for the whole life of each concession, long after the builders have left. Operators that build a PPP program now will run the assets of the next fifty years. This guide invites utilities and infrastructure operators in Jordan to launch that program, starting with the projects at home.

THE GUIDE

Run the $500 trillion PPP infrastructure opportunity

Your company launches a dedicated PPP operations program, a team and a set of offers that bid for operation and maintenance contracts and full concessions and run each asset on performance with AI and robotics, starting with Jordan's $86 billion of projects and the $46 billion anchored in Aqaba.

01 **A PPP operations team.** A dedicated team that knows how concessions are prepared, procured and paid tracks every project in water, power, transport, ports and waste, and joins consortiums early, while sponsors are still choosing their operator.

02 **From O&M contracts to full concessions.** The program starts with operation and maintenance contracts on assets others have built and moves up to full concessions in which your company invests, operates and collects tariffs, tolls or availability payments.

03 **Performance-based contracts.** PPPs pay operators for availability, service levels and outcomes such as water delivered, power available or ships handled. The program prices those targets with data and builds the systems that meet them every day.

04 **Small-scale PPPs and direct proposals.** Jordan's 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, and PPP Law No. 19 of 2023 accepts direct private proposals under Article 15. Your company can propose leak reduction, pumping efficiency or waste-sorting projects and run them as concessions.

05 **Robotics and AI in operations.** Leak-finding robots, inspection drones, predictive maintenance and digital twins let your company run more assets with the same teams and meet its performance targets with fewer failures.

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. Every one of them will need an operator for decades.

$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 operator that runs one asset at home can carry the same systems and teams to the next concession 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 operators

Water	Miyahuna supplies Amman's water; Disi Water Company operates the Disi conveyance under BOT. 29 projects, $6.7bn of forward investment. www.JordanPPP.com/sectors/water
Storage and Grids	JEPCO, IDECO and EDCO distribute electricity; Orange Jordan wheels solar power through IDECO's grid. 25 projects, $1.4bn of forward investment. www.JordanPPP.com/sectors/grid
Wastewater and Reuse	Samra Project Company (Suez and Morganti) runs As-Samra under a 25-year PPP; treated water feeds agriculture. 20 projects, $946m of forward investment. www.JordanPPP.com/sectors/wastewater
Transport	Airport International Group operates Queen Alia International Airport, concession extended to 2039. 32 projects, $8.1bn of forward investment. www.JordanPPP.com/sectors/transport
Ports and Logistics	APM Terminals operates Aqaba Container Terminal with ADC to 2046. 23 projects, $3.6bn of forward investment. www.JordanPPP.com/sectors/logistics

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 operators

AI moves an operator from repairing failures to preventing them. Sensors and digital twins model each asset in real time, forecast demand and flag the pump, transformer or crane that will fail before it does, so maintenance follows the data. In a performance-based PPP every avoided outage protects revenue, and the same models let your company price a bid on the true condition of the asset.

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 operators

Robotics lets an operator hand more of the dangerous and repetitive work to machines. Pipe robots locate leaks from inside the network, drones survey power lines, roads and port cranes, and automated lines sort waste, so a small team can maintain a large network and still meet its performance targets.

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 operators

An operating asset with a performance record suits tokenization best. Your company can offer tokenized stakes in the concessions it runs, pay holders from tariffs and availability payments as they arrive, and publish live performance data to a shared registry, which gives investors and the contracting authority one record of how the asset performs.

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 operators

Small PPPs let an operator test new ways to run assets at low risk, from sensors and digital twins to robotic maintenance and new service contracts. Every pilot leaves behind operating data that sharpens the operator's pricing, and an operator that runs labs sees the next generation of assets before they reach tender.

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 operators

An operator knows better than anyone where an asset loses water, power or time. A direct proposal lets it turn that knowledge into a performance contract or a full concession of its own design, and keep the right to match the best offer if the project goes to tender.

WHY OPERATORS

Operators decide whether a PPP delivers its service

A PPP pays for a service over decades, and the operator delivers it every day of the concession. Sponsors bring the equity, lenders bring the debt and contractors bring the build, while the operator earns the revenue that repays them.

Where operators fit in a PPP

Bid	Operating plans, performance targets and lifecycle cost models that make a consortium's offer credible.
Equity	A stake in the project company that aligns the operator with the sponsors across the concession.
Mobilization	Commissioning, staff transfer, systems and the takeover of existing assets from the public owner.
Operation	Daily operation and maintenance under performance-based contracts paid through tariffs, tolls or availability payments.
Handback	Lifecycle renewal and the return of the asset to government in the condition the contract requires.

What changes for operators

AI, robotics and tokenization change how an operator earns its revenue and proves its performance. Sensors and digital twins report the condition of every asset in real time, so availability and service levels can be measured on live data. Robots and drones carry more of the inspection and maintenance work, which lowers the cost of meeting each target, and tokenized stakes let investors own part of an operating concession and follow its performance as it happens.

Why a program, and why now

Without a program, an operator waits for a consortium to invite it and prices each bid from scratch. A program gives your company a team, an operating model and standard performance terms that make each new bid faster and more accurate than the last, and it moves the company from service contracts to concessions it co-owns. Jordan's pipeline is large and early, and the operators who join consortiums as they form will run those assets for decades.

THE PROGRAM

How the program could work

The program can sit beside the company's existing operations, with a PPP team at its center and the people, systems and track record the company already has behind it.

PPP team	A small team of operations, commercial, finance and legal people that covers every PPP in the pipeline from the first market sounding.
Sectors	Water and wastewater, power and renewables, roads and rail, ports and logistics, and waste and recycling.
Contract ladder	A path from operation and maintenance contracts to performance-based concessions and equity in project companies.
Performance model	Pricing of availability, service levels and lifecycle costs built from the company's own operating data and tested on every bid.
Technology	Robotics, sensors, predictive maintenance and digital twins deployed as standard on every asset.
Direct proposals	Operational improvement projects brought to government under Article 15, including small-scale PPPs below $14.1 million.
Partners	Standing agreements with contractors, developers, banks and infrastructure funds that complete each consortium.

What the company gains

The company gains contracts that run for decades, revenue tied to the service it delivers and a stake in the assets it runs. Each concession also builds an operating record that lenders and contracting authorities trust, which qualifies the company for larger assets across the region.

It also gains a position in the next form of operations. The first operator in the region to run its assets with robots, sensors and digital twins and to publish live performance to investors will become the reference that contracting authorities measure other bids against.

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 an operator can start

Any utility or infrastructure operator in Jordan can take this guide forward. The first steps use the teams, assets and systems the company already runs.

Mandate	Board approval for a PPP operations program, with its sectors, the contracts it will bid for and its first-year goals.
Team	A named program lead, with operations, engineering, commercial and legal people drawn from the company's existing teams.
Pipeline	A map of Jordan's $86 billion of projects by sector and stage, and early meetings with the contracting authorities that will tender their operation.
Systems	The sensors, digital twins and robotic maintenance the company will bring to its first bids.
Partners	Developers, contractors, lenders and technology companies to complete each consortium.
Pilot	A first performance contract, small-scale PPP or direct proposal, taken from idea to submission.

Jordan has the projects, assets that need running for decades and a law that accepts unsolicited proposals. A PPP program gives your company the contracts to run them and a head start in operating the superintelligent infrastructure future.

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