

An aerial photograph of a multi-lane highway stretching from the bottom center towards the top of the frame. The highway is flanked by rows of young trees planted in the shoulders. The surrounding landscape consists of fields with patches of snow or frost, particularly visible on the right side. The entire image is framed by a thick red border.

# Jacobs

Challenging today.  
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## Driving results

How Public Private Partnership agreements improve aging roads

## Balancing risk and investment in maintaining and upgrading existing highway networks

How can governments keep roads safe and traffic flowing over time? This article explores how operations and maintenance provisions in brownfield highway Public Private Partnerships (PPPs) improve infrastructure outcomes and maximize long-term value.

# Public Private Partnerships (PPPs)

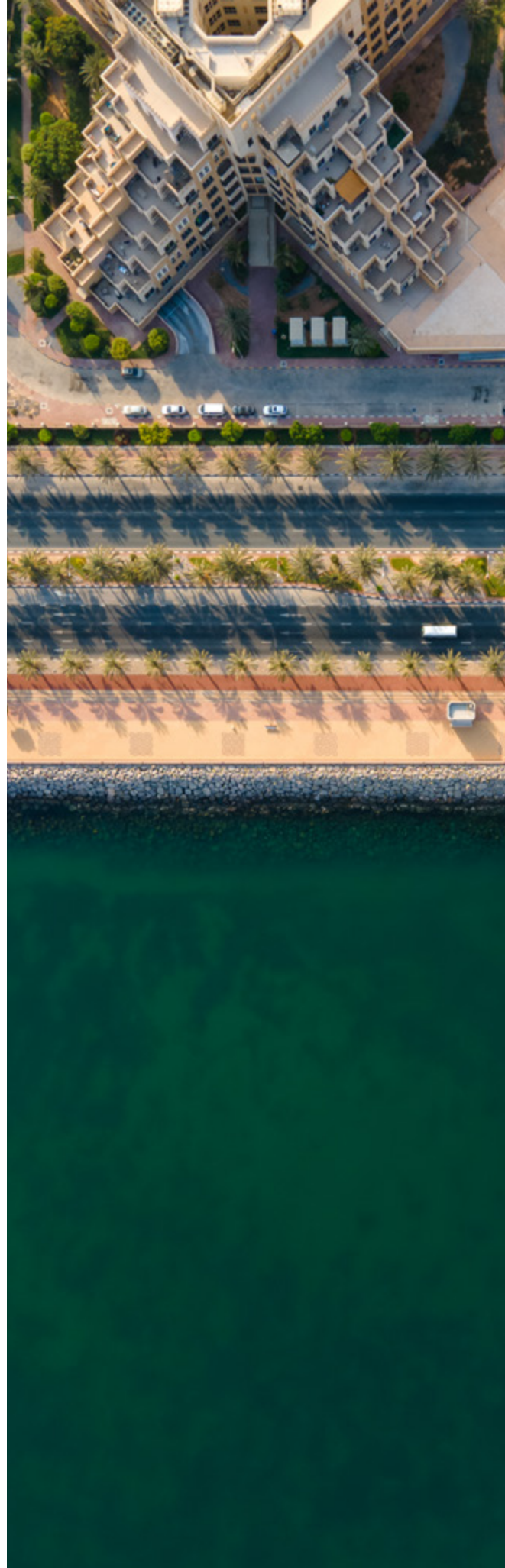
Public Private Partnerships — also known as P3s or Private Finance Initiatives (PFIs) — are long-term contracts between governments and private entities to finance, design, construct, operate and maintain facilities or services traditionally provided by the public sector. Often lasting 25–30 years, PPPs are commonly used to deliver infrastructure projects while sharing risks and rewards between both sectors.

While the basic structure of PPPs can apply to many projects, key elements differ depending on the type of deal at hand. This article explores elements of PPPs specifically designed to address operations and maintenance of existing roads and highways. It also shares insights and recommendations for optimizing these agreements to boost infrastructure quality and performance.

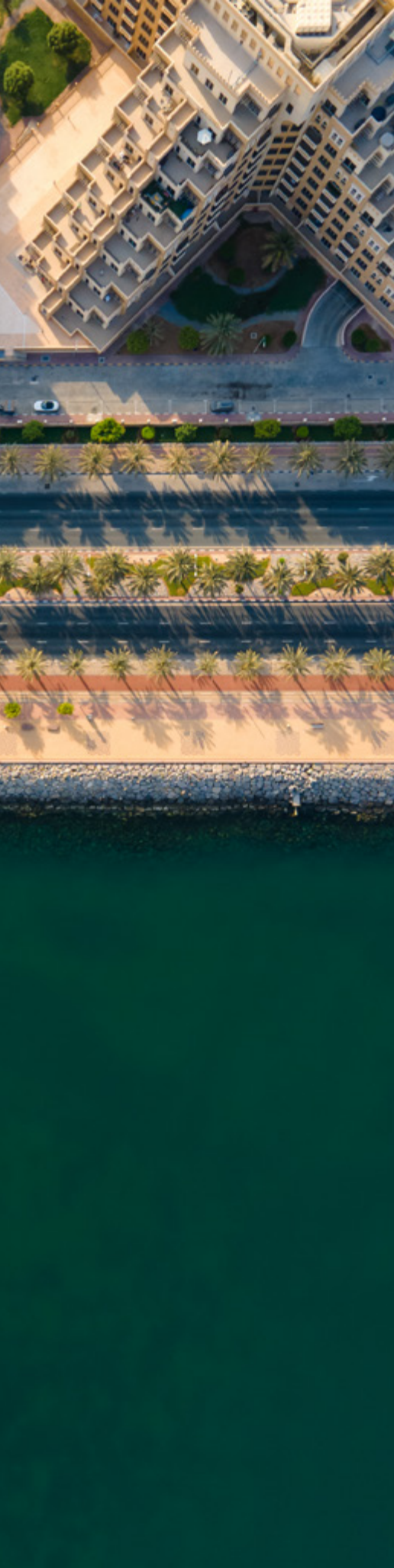
## Why brownfield highway projects matter

Brownfield projects focus on upgrading or expanding existing roads and highways. These projects are essential to extending the life of aging infrastructure, improving safety, traffic flow and/or user experience. PPPs often play a crucial role in delivering these projects and raising the quality of service for road users.

The core goal of O&M activities in brownfield projects is to preserve existing road infrastructure over the long term. A correctly structured O&M PPP agreement transfers day-to-day management, operations and maintenance responsibilities to the private sector with clearly specified performance metrics. This shift allows for more efficient delivery, introduces private financing, and reduces upfront public investment. Risk is shared between sectors based on the agreement's structure.







## Balancing risks and rewards

When defining the payment mechanism to the private sector in a brownfield road PPP, the government needs to consider who retains two key risks, which are:

- **Traffic risk:** If actual usage (vehicle counts, passenger numbers) differs from forecasts this may impact revenue (if the road is tolled or shadow-tolled) and O&M costs (higher traffic leads to more wear and tear).
- **Revenue risk:** Revenue per vehicle (for a tolled or shadow-tolled road) may be less than expected due to pricing issues, payment collection mechanism, regulatory changes and operational challenges.






In this sense, there are four common payment mechanisms for road PPP projects based on the allocation of these traffic and revenue risks, as follows:

- **Real tolls:** Users pay directly to use the road. Traffic and revenue risks shift to the private party.
- **Shadow tolls:** Governments pay the private party based on traffic metrics, with the users not having to pay directly for the road usage. Traffic and revenue risk is shared between both parties.
- **Availability payments:** Governments pay the private party for meeting performance and quality standards. Traffic and revenue risk is largely retained by the government (with the private sector only being subject to the impact of higher/lower traffic on maintenance costs).
- **Revenue sharing:** Often used in tolled projects, lower-than-expected and higher-than-expected revenues are shared between parties. Traffic and revenue risks are shared between parties.

Each approach aligns incentives to encourage efficiency and maintain infrastructure quality.

## Case Studies: Brownfield PPPs around the world

We analyzed four global brownfield highway PPP case studies, focusing on the O&M aspects, contract structure and funding. While there is a range of payment mechanisms, the most common was the Availability Payment Model.

 Project	 Focus	 Payment Mechanism	 Contract Duration	 Funding
<b>Portsmouth Highways PFI, U.K.</b>	Rehabilitation and maintenance	Availability payments	25 years	Credits from the Department for Transport (UK)
<b>Western Roads Upgrade, Australia</b>	Improving arterial road networks	Availability payments	20 years	Victorian State Government
<b>Road Annuity Lot 18 PPP, Kenya</b>	Road upgrades and long-term upkeep	Availability payments	10 years	Kenya National Road Annuity Programme
<b>Presidio Parkway PPP, U.S.</b>	Replacement, rehabilitation, and environmental safeguards	Availability payments	30 years	State and local transportation funds

Our analysis highlights several important trends, including:

- **Long-term contracts** (10-30 years) provide stability for maintenance and operations, ensuring infrastructure longevity and efficient resource allocation.
- **Performance-linked payments** incentivize high-quality outputs that meet contractual standards.
- **Focus on risk management** fosters accountability between public and private partners.
- **Prioritizing sustainability and efficiency** helps extend asset lifespan and improve infrastructure networks for future use.



## The road ahead

PPPs are a powerful framework for addressing the growing need to maintain and modernize existing road and highway infrastructure. With the right funding, structure and risk-sharing approaches, brownfield road and highway PPPs can deliver lasting value to governments and private entities, and enhance road quality and safety for communities worldwide.





## About the authors



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