

Risk Matrix for Toll Roads

Full Description

In selecting appropriate toll roads for asset recycling, the selected toll roads should have an operating track record, thereby **de-risking the private sector of upstream risks**, such as land acquisition, project planning, design risk, construction risks (time and cost-overrun risk), and development-related approvals.

Checklists of issues to consider when preparing or reviewing sector-specific asset recycling guidelines for toll roads risk sector:

- [Operating Risk](#)
- [Demand / Revenue Risks](#)
- [Financial Risk](#)
- [Change in Law](#)
- [Force Majeure](#)
- [E&S Risks](#)
- [Climate Risks](#)

Sample risk matrix – Toll Roads

Risk		Description	Public	Private	Shared	Mitigation
OPERATING RISKS	Inadequate performance	The risk of service quality provided by the concessionaire not meeting the toll road minimum service standard and any additional contracted service standards or availability.¹		x		<p>Ensuring the appointment of a competent concessionaire who could remediate inadequacies in performance.</p> <p>Periodic monitoring and reporting of compliance with toll road minimum service standard</p>

Risk		Description	Public	Private	Shared	Mitigation
O&M costs overrun	Risk of O&M costs being higher than forecast or budgeted.		x			Appointment of competent concessionaire and management putting into place timely remedial steps.

Risk		Description	Public	Private	Shared	Mitigation
Life cycle costs overrun	Risk of lifecycle costs being higher than forecast or budgeted.		x			Appointment of competent concessionaire and management putting into place timely remedial steps to manage increased costs; passing of increased costs to end-users within the parameters of toll setting regime.

Risk		Description	Public	Private	Shared	Mitigation
Utilities costs overrun	Risks of utility costs being higher than estimated or budgeted due to inefficiencies or increased charges.		x			Appointment of competent concessionaire; proactive asset management to ensure that assets are maintained in a manner that optimises costs.

Risk		Description	Public	Private	Shared	Mitigation
Latent Defects and Existing Liabilities	Risks of latent defects and existing liabilities in the road assets.			x		Conduct adequate technical due diligence; the concessionaire to bear the risk up to a certain threshold beyond which the risk will be borne by the public sector.
DEMAND / REVENUE RISKS	Demand and traffic risk	Actual traffic is lower than forecast causing a shortfall in toll revenue against budgeted revenue.		x		Ensure that traffic survey and forecast are conducted by competent advisors; defer timing of capacity-driven capital expenditure program; re-deployment of staff and re-calibration of level and intensity of operational functions.

Risk		Description	Public	Private	Shared	Mitigation
Failure to collect toll charges	Due to failure or non-optimality of collection system from users.		x		Proven toll collection system and good operational performance.	
Toll setting risk (1)	Risk that toll charges indexation does not match inflation or cost increases and escalations, thereby impacting margins or that the relevant authority does not approve escalation as per agreed fee and charges escalation mechanism.			x	Clear regulations or contract terms that regulate the rate and adjustments of toll charges.	

Risk		Description	Public	Private	Shared	Mitigation
Toll Setting Risk (2)	Risk that that the relevant authority does not comply with the toll escalation mechanism and fails to allow for the indexation/increase to the toll charges (even where allowed).	x			This would constitute a default on the part of the relevant authority; such the occurrence of such an event would require compensation.	
FINANCIAL RISK	Failure to achieve financial close	Inability to achieve financial close due to market uncertainty or the project capital structure is not optimal.		x		Good coordination with potential and credible lenders.
	Foreign exchange rate risk	Fluctuation of foreign exchange rate.		x		Financing in local currency to the extent possible; taking into account currency fluctuation hedging instruments; such as future contracts and currency options.

Risk		Description	Public	Private	Shared	Mitigation
Inflation and interest rate risk	Increase of inflation rate used for estimating life-cycle costs and interest rate.		x		Fee and charges indexation factor; interest rate hedging.	
CHANGE IN LAW	General change in law	Change in law such as taxation which impacts all businesses and industries.		x		General change in law risk should be borne by the concessionaire.
	Discriminatory or project specific change in law	Change in project/sector-specific law or regulation such as fee and charges setting.	x			Mediation, negotiation, political risk insurance.
FORCE MAJEURE	Natural disasters	The occurrence of natural disasters disrupting operations.			x	Insurance, to extent possible. In extended FM, parties will have right to termination. Climate adaptation plan. Emergency Preparedness and Response plan (EPR plan) / Disaster Risk Management plan (DRM plan). Incorporate Qualified Climate Risk Events.

Risk		Description	Public	Private	Shared	Mitigation
Political force majeure	Government action and inactions.	x				Insurance, to extent possible; termination with compensation if settlement cannot be reached.
Prolonged force majeure	If above prolongs for 6 to 12 months, may cause economic problems to the affected party (esp. if insurance does not exist).			x		Either party should be able to terminate the contract and trigger an early termination.

Risk		Description	Public	Private	Shared	Mitigation
E&S Risks	E&S risks management	Road development and operation create many E&S impacts and risks, which if not appropriately managed, can result in impact on the social and natural environment.		x		<p>The party in charge for construction, Operation and Maintenance (O&M) should have undertaken E&S Studies prepared management plan to mitigate any adverse impacts risks and consistent with applicable laws.</p> <p>Replanting trees and mitigating the cutting of trees in the road area.</p> <p>Reducing the use of electricity by using renewable energy and introducing energy efficiency measures and reducing fuel consumption by using environmentally friendly equipment.</p> <p>Design and implementation of noise control measures (e.g., noise barriers along the border of the right of way such as earthen mounds, walls, and vegetation).</p> <p>Solid waste management plan.</p> <p>Integrated vegetation management (IVM).</p> <p>Management practices to prevent and control impacts.</p>

Risk		Description	Public	Private	Shared	Mitigation
Risk of noncompliance on the E&S aspect of the concession agreement.			x	The parties to review compliance of the E&S aspect of the Concession Agreement, during construction and O&M.		

Risk	Description	Public	Private	Shared	Mitigation
<p>Climate risks *</p>	<p>Deterioration of road surface integrity.</p> <p>Thermal expansion of bridge joints and paved surfaces.</p> <p>Damage to highways, roads, underground tunnels and bridges due to flooding, inundation of coastal areas and coastal erosion.</p> <p>Increased scour of bridges.</p> <p>Increased instability of embankments.</p> <p>Damage to road infrastructure due to landslides.</p> <p>Increased susceptibility to wildfires.</p>				<p>Enhance design criteria to withstand extreme heat.</p> <p>Improve emergency repair procedures.</p> <p>Upgrade and reinforce drainage systems.</p> <p>Integrate climate resilience in maintenance regimes and road surface specifications.</p> <p>Using permeable paving surfaces to reduce run-off during heavy rainfalls.</p> <p>Road slope and side cliff design with high water</p>

**Based on "WB (2016) - "Emerging Trends in Mainstreaming Climate Resilience in Large Scale, Multi-sector Infrastructure PPPs"*

Key variables to monitor on climate risks and its impacts, in particular for toll roads assets:

- Pavement cracks / potholes (road area affected)
- Embankment failure / Landslides (road length affected)
- Asphalt wear (roughness)
- Wildfires Events in 100 km surrounding area (# of events)
- Bridge joints expansion (in millimetres)
- Scour (road area affected)
- Maximum temperature and deviation vs. average monthly max temperature (in °C)
- Sea level rise (in meters)
- Flooding (road length affected)
- Intense precipitation events (in millimetres)
- Storm surge (# events and intensity)
- Climate related accidents (# of events)
- Paint peeling (road length affected)
- Road unavailability (days per year)
- GHG emissions (tons CO2 e.g., per year)

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Page Specific Disclaimer

The Guidelines have not been prepared with any specific transaction in mind and are meant to serve only as general guidance. It is therefore critical that the Guidelines be reviewed and adapted for specific transactions To find more, visit the Guidelines to Implementing Asset Recycling Transactions [Section Overview](#) and [Content Outline](#), or [Download the Full Report](#).

