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Risk Matrix for Toll Roads

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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**		**Ensuring the appointment of a competent concessionaire who could remediate any inadequacies in performance.** **Periodic monitoring and reporting of the compliance with the toll road minimum service standard.**

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.**
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.**

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.**
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 advisers; defer timing of capacity-driven capital expenditure program; re-deployment of staff and re-calibration of level and intensity of operational functions.**
	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.**
	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/increment 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 accounts currency fluctuation hedging instruments; such as future contract and currency options.**
	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 the right to terminate.** **Climate adaptation plan.** **Emergency Preparedness and Response plan (EPR plan) / Disaster Risk Management plan (DRM plan).** **Incorporate Qualified Climate Risk Events.**
	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.**

						The party in charge for construction and Operation and Maintenance (O&M) should have undertaken E&S Studies prepared management plans to mitigate any adverse impacts and risks and consistent with applicable laws. **Replanting trees, and mitigating the cutting of trees in the road area.** **Reducing the use of electricity by using renewable energy and introducing energy efficiency measures and reducing fuel consumption by using environmentally friendly equipment.** **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).** **Solid waste management plan.** **Integrated vegetation management (IVM).** **Management practices to prevent and control impacts to terrestrial and aquatic habitats (e.g., wildlife underpasses,**
		Road development and operation create many E&S impacts and risks, which if not				

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.**

					Enhance design criteria to withstand extreme heat. **Improve emergency repair procedures.** **Upgrade and reinforce drainage systems.** **Integrate climate resilience in maintenance regimes and road surface specifications.** **Using permeable paving surfaces to reduce run-off during heavy rainfalls.** **Road slope and side cliff design with high water permeability and protection.** **Install fire**
	Deterioration of road surface integrity.				

**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)

Related Content

- **Guidelines for Implementing Asset Recycling Transactions (Download PDF version)**

Additional Resources

- Identifying Risks
- PPP CYCLE

This section has not been prepared with any specific transaction in mind and are meant to serve only as general guidance. It is therefore critical that the content will be reviewed and adapted for specific transactions.

This is a new section of the website and is currently in draft form. For feedback on the content of this section or to suggest additional links or materials, please contact the PPP Resource Center using the feedback form.

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