

Risk Matrix for Airports

Full Description

Sample risk matrix – Airports

Risk	Description	Public	Private	Shared	Mitigation
Operating Risk	Inadequate performance		x		Ensuring the appointment of a competent operator who could remediate any inadequacies in performance.
	O&M costs overrun		x		Appointment of competent operator and management putting into place timely remedial steps.
	Life cycle costs overrun		x		Appointment of competent operator and management putting into place timely remedial steps to manage increased costs; passing of increased costs to end-users within the parameters of fee and charges setting regime
	Utilities costs overrun		x		Appointment of competent operator proactive asset management to ensure that assets are maintained in a manner that optimises costs.
	Latent Defects and Existing Liabilities			x	Conduct adequate technical due diligence; the Private Sector 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		x		Ensure that traffic survey and forecast are conducted by competent advisers; defer timing of capacity driven capital expenditure programme; re-deployment of staff and re-calibration of level and intensity of operational functions,
	Non-aeronautical revenue risk		x		Comprehensive feasibility study to be conducted, including detailed review of Government objectives and plan; due planning and marketing initiatives.

Failure to collect airport charges	Due to failure or non-optimality of collection system from passengers and airlines		x		Proven collection system and good operational performance.	
Charges setting risk	Risk that fees and 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 fees.	
Financial	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.
	Inflation and interest rate risk	Increase of inflation rate used for estimating life-cycle costs and interest rate		x		Fee and charges indexation factor and interest rate hedging.
Change in law/ regulation	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-specific law or regulation such as fee and charges setting	x			Mediation, negotiation; political insurance;

Force Majeure	Natural disasters	The occurrence of natural disasters disrupting operations			x	<p>Insurance, to extent possible.</p> <p>Climate mitigation and adaptation plan.</p> <p>Emergency Preparedness and Response plan (EPR plan) / Disaster Risk Management plan (DRM plan).</p> <p>Incorporate Qualified Climate Risk Events.</p>
	Political force majeure	Events of war, riots, civil disturbance			x	<p>Insurance, to extent possible; termination with compensation if settlement cannot be reached.</p>
	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	<p>Either party should be able to terminate the contract and trigger early termination.</p>

<p>E&S Risks and Climate Risks</p>	<p>E&S risks management</p>	<p>Airport 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.</p> <p>Changes to noise emission pattern and increased complaints.</p> <p>Changes in ecosystems and associated risks.</p> <p>Reduced air quality.</p> <p>Changes in ecosystems and distributions of wildlife and wildlife attractants.</p>	<p>x</p>	<p>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.</p> <p>Reducing the use of electricity by using renewable energy and reducing fuel consumption by using environmentally friendly ground support equipment and transportation.</p> <p>Sustainable landing and take-off cycle of aircraft(s) and ground support operations, single engine taxiing.</p> <p>Targeted charges to airlines based on noise measurement. Restrictions on flight operations during night time.</p> <p>Design and implementation of noise control measures (e.g. noise barriers along the boundaries of the airport such as earthen mounds, walls).</p> <p>Solid waste management plan.</p> <p>Integrated vegetation management (IVM).</p> <p>Wildlife hazard management plan (WHMP), including e.g. bio-acoustic technology.</p> <p>Facilitate ecosystem-based adaptation.</p> <p>Use of supplementary cementitious materials (SCM) in concrete runways and use of recycled aggregates in taxiway and apron construction.</p> <p>Achieve the environmental sustainability of passenger terminal (e.g. Recyclable food packaging, beverage containers and utensils. Composting and/or food procurement practices aimed at minimizing waste. LED and other types of energy-efficient lighting reduce electricity usage.)</p>
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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.
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Climate risks *	<p>Deterioration of runway surface integrity through softening and aircraft rutting.</p> <p>Flood risks to airports due to increased precipitation and/or sea level rise.</p> <p>Lift of aircraft reduced due to higher temperatures.</p> <p>Temperature change affect navigational signals and satellite coverage.</p> <p>Electrical power supply failed during strong winds and storms.</p> <p>Increasing wildlife-strike risks due to changes in the local ecosystem.</p> <p>Use of airport as shelter or as hub for relief operations.</p>		x	<p>Enhanced runway design criteria (e.g. increase height above sea-level of runaway to withstand a 1-in-100 year storm surge event).</p> <p>Integrate climate resilience in maintenance regimes and runaway surface specifications.</p> <p>Improve emergency repair procedures.</p> <p>Upgrade drainage systems.</p> <p>Installed permeable pavement to drain storm water.</p> <p>Installation and closure of flood/tidal gates and flood-storage basins</p>
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* Based on "WB (2016) - [Emerging Trends in Mainstreaming Climate Resilience in Large Scale, Multi-sector Infrastructure PPPs](#) and based on "[ACI Resolution 3/2018 on resilience and adaptation to climate change](#)" and based on "[Sydney Airport 2021 Response to the Task Force on Climate-related Financial Disclosures](#)"

Key variables to monitor on climate risks and its impacts, for airport assets:

- Runway Pavement cracking / potholes (runway area affected)
- Wildfires Events in 100km surrounding area (# of events)
- Maximum temperature and deviation vs. average monthly max temperature (in °C)
- Sea level rise (in meters)
- Flooding (airport area affected)
- Intense precipitation events (in millimetres)
- Wind speed (in km/hour)

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