Appendix K - Performance Measurement Indicators

	Key Performance Indicator	Description	Measure	Target
Leading	**Asset life**	*This monitors the maintenance history and interventions on critical assets throughout their life. Other data recorded is component creation, usage information (hours/miles operated) and scrappage date. Assets considered are not limited to wheelsets, bogies, engines, motors, AWS/TPWS, etc.*	Preventive planning	Extend maintenance periodicities
	Wheel wear rate	*To monitor/compare the rate of wheel wear in different seasons for better understanding of seasonal impact on units. Also helps to prioritise planned maintenance.*	Preventive planning	Uptime & industrial wheels measurement limit
	Unavailability of mandatory exam kit per period	*Availability checklist of all required tools, parts & components for scheduled maintenance. Parts are usually made available to fitters as kits placed by the side of the maintenance road. This should record:* $\frac{Total\ number\ of\ deficient\ kits\ per\ shift}{Total\ number\ of\ kits\ per\ shift}\ X\ 100$	Maintenance scheduling	<10%
	Open work orders	*Monitors all open work orders for a depot across all fleets per period as a percentage of the total volume of work raised.* *e.g. wheel lathe, HVAC, doors, etc.*	Maintenance scheduling	<20%
	Available for services	*Records all units ready/available for services on daily/weekly basis. This should be measured at a particular time of day, prior to morning and evening service peaks, e.g. at 05:30*. Example TOC operates 300 trains per week and 240 trains are available. $\frac{240}{300}x100 = 80\%$	Uptime	% of the total fleet
	Repeat defects	*Measures the number of reported incidents linked to a known fault per period. Repeat defects show that the underlying root cause has not been identified.*	Maintenance strategy	<5
	Delays due to defect	*Reports total primary delay attributed to a sub-system per period and displayed as a Pareto so*	Maintenance strategy	<10 delay incidents per

		engineers can see which sub-system is having the largest impact on service. *It helps to show which sub-systems need more work/fault-finding.*		device per period
	Outstanding defects	*Monitors reported issues, defects which have not been attended/instigated, e.g. any isolation by drivers logged in the book but not raised as a work order.*	Maintenance scheduling	<5 per unit per week
	Degraded mode	*Monitors the volume of trains per period entering service with an allowable degraded mode as per TOC's DOTE.*	Performance	<5 per unit
Lagging	**Technical issues per period**	*Records the total number of technical defects per unit per period including MTIn and other non-service-affecting defects. It shows which unit is performing worst.*	Performance	No. of defects per unit
	Number of days taken to repair	*Monitors how many days it takes to repair/attend to a reported defect.*	Execution	<3 days
	Tweet (fault reported by customers)	*Monitors how long it takes to repair/feed back on faults/issues reported by passengers on social media. The issue must be reported/mentioned more than 5 times by at least 5 different passengers.*	Execution	<5 days
	Late on	*Monitors the sum of unit lateness per period to the depot for planned maintenance and examination. It shows how much maintenance time is lost due to unit lateness as a sum of the minutes.*	Punctuality	>3 mins
	Off-depot lateness measure	*Monitors the sum of unit lateness per period off the depot for operation. It shows how much operational time is lost due to unit lateness as a sum of the minutes.*	Punctuality	>3 mins
	Maintenance-induced failure	*Monitors the number of issues raised after light or heavy maintenance work. Some units come back worse than before (something missed or incorrectly added during scheduled maintenance).*	Performance	Total per period