
**INVESTMENT CASE – CRANE BORERS
ESSENTIAL ENERGY FLEET**

FOR INFORMATION

Date Prepared: 18 January 2023

Recommendation

Essential Energy endorses this investment case summarising the plan and forecast for expenditure associated with the Crane Borer fleet asset class.

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Executive Summary

This case proposes expenditure to maintain, operate and continuously improve Essential Energy's crane borer fleet in accordance with legislative and regulatory compliance in alignment with business objectives and customer expectations.

Essential Energy owns and operates a fleet of crane borer plant and carriers which are critical to the safe, efficient, and resilient operation of the distribution network. The fleet comprises 108 assets across the Essential Energy footprint.

Essential Energy places the highest priority on the safe operation of the network for the community and the safe delivery of services by our workforce. Motor vehicle related risks are amongst the greatest concern for any business operating over a distributed service area.

Cyclic renewal of assets in accordance with life cycle strategies is critical to the ongoing optimisation of cost, risk and performance metrics whilst ensuring the fleet is fit-for-purpose, future focused and efficient. The current fleet program will proceed, progressively achieving and maintaining target average age/service profiles. The fleet expenditure profile will be incrementally stabilised to mitigate recurring historical peaks and troughs.

Key drivers include fit-for-purpose assets, continued system and process enhancement, resilience and emissions lowering.

This case presents two options, with consideration to a base case contrasting asset management practices and industry standards:

- **Base Case:**
Continue to operate the existing crane borer fleet, with minimal incremental investment to meet business and legislative obligations.
- **Option 1: Replace according to life cycle strategy**
Replacement of assets in accordance with life cycle strategies and replace overdue assets.
- **Option 2: Stabilise and smoothen expenditure profile (Recommended)**
Combination of smoothing, asset management practices and refurbishment contributing to a prudent and stabilised overall fleet expenditure supporting operational resilience.

Option 2 is recommended. This investment will support the Business, Customer and Community through continued optimisation of safe, reliable and fit-for-purpose assets to support the planned works delivery program.

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Investment Summary

Investment Program – Fleet Management Crane Borers			
Investment Value	Expenditure (Recommended Option)		\$m FY24 Real Terms
	Program Capital Expenditure		\$24.4
	Program Operating Expenditure		\$12.4
	Total program/project expenditure		\$36.8
	Net Present Value (NPV)		-\$26.1
Business Drivers	Compliance and Risk		
Period	FY25 - 29		
Strategic Alignment	Business Strategy		Contribution
	Continuous improvement in safety. Culture and performance		Enables
	Operate at industry best practice for efficiency, delivery best value for customer		Enables
	Deliver real reductions in customers' distribution charges		Enables
	Reduce the environmental impact of Essential Energy where it is efficient to do so		Enables

Note:

- All values are in middle of the year 2023-24 real dollar terms
- All values are forecast on a whole-of-business basis (prior to application of the Cost Allocation Model)

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1. Context and Drivers

This case proposes expenditure to maintain, operate and continuously improve Essential Energy's crane borer fleet in accordance with legislative and regulatory compliance in alignment with business objectives and customer expectations.

Essential Energy owns and operates a fleet of crane borer plant and carriers which are critical to the safe, efficient, and resilient operation of the distribution network. The fleet comprises 108 assets across the Essential Energy footprint.

Essential Energy places the highest priority on the safe operation of the network for the community and the safe delivery of services by our workforce. Motor vehicle related risks are amongst the greatest concern for any business operating over a distributed service area. This is particularly true for Essential Energy with over 32.5 million kilometres travelled every year.

Key factors underpinning the safety of fleet operations include:

- Vehicle usage policies, training, and culture
- Reliability and serviceability of vehicles and plant
- Use of vehicles in compliance with specifications
- Risk management and continuous improvement
- Asset management frameworks based on ISO55000 principles

Life cycle strategies form part of the fleet management practices in accordance with Essential Energy's asset management frameworks.

The following strategy overview is provided in supporting documentation:

- **10.08.05 Fleet crane borer asset class strategy**

The Essential Energy fleet has stabilised from previous and current regulatory reductions in response to the operational needs of the business. Fleet optimisation across asset classes is continuously assessed based on internal and external factors to ensure prudent and reliable support of the network.

The following contributory drivers influence fleet management over the next regulatory period:

- Continued portfolio investment
- Continued system and process enhancement
- Resilience
- Lowering emissions - alternative propulsion

1.1. *Continued portfolio investment*

Cyclic renewal of assets in accordance with life cycle strategies is critical to the optimisation of cost, risk and performance metrics whilst ensuring the fleet is fit-for-purpose and efficient. Adoption of new technologies and systems will continue to be integrated as part of cyclic asset renewals to ensure a future focused fleet.

As part of our acquisition/replacement cycles Essential Energy assesses available and alternative vehicles/assets through an analysis of cost of ownership, maintainability, buildability, reliability, safety and availability. This assessment is undertaken with consideration of user feedback to ensure the replacement asset continues to meet or exceed the current/future performance and safety requirements of the operational works program.

Figure 1 (over page) details the asset health related incident rate over time. Increases in this metric demonstrate a fleet of degrading condition, reduced effectiveness, or obsolescence (becoming unfit-for-purpose). The continued reduction in health-related incidents indicates fleets asset management practices and portfolio investment program in alignment with life cycle strategies is optimising the cost, risk and performance of the fleet.

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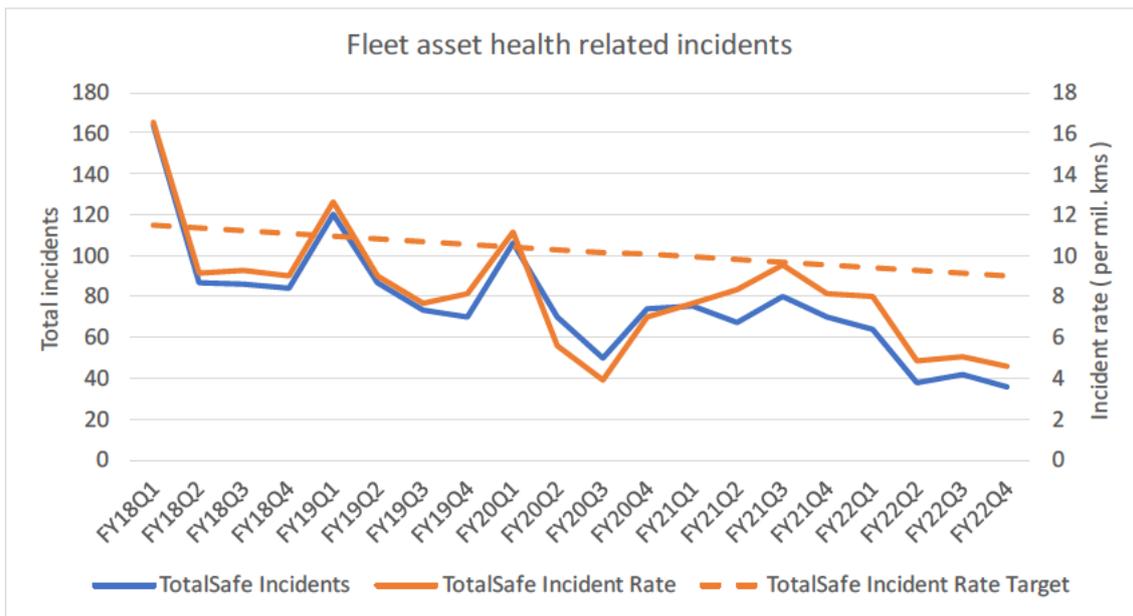


Figure 1 - Fleet asset health related incidents - all assets

1.2. Continued system and process enhancement

Essential Energy will continue to improve and enhance systems and processes in accordance with asset management best practices and frameworks for operational efficiency. End to end fleet management practices have been internalised during the current regulatory period. This enables greater integration of fleet safety, performance, utilisation, cost and reliability data into real time reporting, incident management and analytics.

Ongoing system and process enhancements ensure Essential Energy continues to enable greater works delivery efficiency through informed and prudent expenditure.

1.3. Resilience

Vehicle supply chains have been impacted significantly and are still in a process of recovery from the pandemic. This has resulted in substantial increases to vehicle lead times and reductions in availability. To mitigate impacts to vehicle replacement and refurbishment cycles which ensure safe, reliable and efficient vehicles, Essential Energy's fleet management function continues to develop and undertake in-house asset fit-out and plant overhaul activities reducing reliance on external suppliers and service providers.

In addition to the pandemic, extreme climate events experienced during the current regulatory period have resulted in a significant change to the operating conditions and continue to impact road conditions negatively. Asset monitoring and data analytics will continue to be utilised to ensure specifications, technologies and asset types are fit-for-purpose for the current and future operating conditions. Disaster response activities are improved through in vehicle monitoring systems enabling the right assets to be located and distributed to maximise the recovery capabilities.

1.4. Lowering emissions – alternative propulsion

Our customers have indicated their support for sustainability investments to reduce emissions and lower our environmental impact, aligning with our prudent continued investment into fleet of the future with proven efficient future focused technologies.

Asset lifecycle replacement periods ensure Essential Energy continues to reduce emissions year on year, with new assets aligning to current vehicle emission standards and efficiencies.

Accelerated lowering of emissions is significantly enabled through the adoption of alternative propulsion technologies across the fleet asset classes. Technology and industry developments have advanced during the current period and are forecast to continue into the upcoming regulatory periods. Essential Energy takes a sustainable and practical approach to alternative propulsion adoption. Industry technology and developments

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will be continuously assessed throughout this period to determine the feasibility of alternative propulsion for this class of assets.

Transition of a traditional combustion asset to alternative propulsion, on cyclic renewal, for enhanced emissions reductions will consider factors including:

- Investment must be prudent – total cost of ownership
- Assets must be fit-for-purpose – operational needs
- Technology must be proven and efficient – reliability of the asset across the operational lifespan

2. Program Objectives

The objective of this Fleet Management investment program is to provision and maintain appropriate fleet assets across the network service area to enable safe and efficient operations and works program delivery.

The proposed investment is aligned with the National Electricity Rules “capital expenditure objectives” (NER 6.5.7(a)) as described below.

NER Capital Expenditure Objectives	Alignment
<p>6.5.7(a)(2) <i>the forecast capital expenditure complies with all applicable regulatory obligations or requirements associated with the provision of standard control services</i></p>	<p>Provision and cyclic renewal of safe, reliable and fit-for purpose vehicles and plant is consistent with sound asset management practices.</p> <p>Fleet asset health related incident metric indicates fleet activities continue to optimise the cost, risk and performance with fit-for-purpose assets.</p> <p>The fit-for-purpose fleet is a critical enabler of Essential Energy delivering network services while maintaining compliance with legislative and regulatory obligations associated with provision of standard control services.</p>
<p>6.5.7(a)(3) <i>the forecast capital expenditure maintains the quality, reliability and security of supply of standard control services</i></p>	<p>As above, the fit-for-purpose fleet enables Essential Energy to deliver operational services and the network program of work, such that the quality, reliability and security of supply of standard control services are maintained.</p>

The proposed investment addresses the NER “capital expenditure criteria” (NER 6.5.7(c)) as described below.

NER Capital Expenditure Criteria	Alignment
<p>6.5.7(c)(1) <i>(i) the forecast capital expenditure reasonably reflects the efficient costs of achieving the capital expenditure objectives</i> <i>(ii) the forecast capital expenditure reasonably reflects the costs that a prudent operator would require to achieve the capital expenditure objectives</i> <i>(iii) the forecast capital expenditure reasonably reflects a realistic expectation of the demand forecast and cost inputs required to achieve the capital expenditure objective</i></p>	<p>The scale of the fleet continues to be stabilised from the previous period enabling efficient operation and capital investment prudence.</p> <p>Vehicles and plant are acquired consistent with the asset management plan, operational requirements and specifications. Continued assessment and adoption of technology advancements ensure assets remain fit-for-purpose, efficient and future focused with respect to industry and operational changes.</p> <p>The planned capital expenditure has been estimated with reasonable forecasts of:</p> <ul style="list-style-type: none"> • Fleet Demand – based on planned operation and utilisation of the fleet across the business footprint • Cyclic Asset Renewal – based on the intent to continue to optimise and sustain the fleet to the average age / service profile • Cost Inputs – based on recent actual pricing including discounting available through NSW Government procurement and buying power where applicable.

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3. Options Analysis

The following options have been considered.

Options Considered:	Assessment
Base Case	Maintain current assets with minimal incremental investment in accordance with compliance requirements.
1. Replace according to life cycle strategy	Replacement of assets in accordance with life cycle strategies and replace overdue assets.
2. Stabilise and smoothen expenditure profile (recommended)	Combination of smoothing, asset management practices and refurbishment contributing to a prudent and stabilised expenditure supporting operational resilience.

Table 1 - Business Case Options

Each of these options is evaluated in the sections which follow.

3.1. Base Case

The base case consists of continuing to operate the existing assets with minimal investment in fleet replacement cycles with compliance related activities underpinning the core of the expenditure. Historical data and industry practice indicates minimal investment into cyclic renewal of assets increases risk profiles, expenditure and emissions whilst reducing reliability and availability.

Two thirds (67%)¹ of vehicle fatalities in NSW occur on country roads. Driving in regional, rural and remote areas of NSW can be a challenging task. Environmental factors such as poor road condition and design – made increasingly worse with the high amount of rainfall experienced across the state, higher speed limits, increased roadside hazards including flora and animal hazards contribute to a greater risk and severity of a crash on regional roads.

All regional towns and connecting roads have been impacted by the heavy and consistent rainfall during this regulatory period, this has contributed to poorer road conditions with eroding edges and potholes that increase the hazards of driving and vehicle damage.

Accelerated deterioration of aging fleet assets has been observed as a result of the current NSW road conditions.

With consideration of the above factors, and to ensure alignment with safety policies, business strategies, regulatory obligations and customer expectations, the base case is not a prudent alternative to the planned renewal of fleet assets.

3.2. Options Comparison

3.2.1 Capex Model Methodology

The fleet capital forecast has been modelled on an asset level and grouped to align with AER asset categories.

Unit prices are based on a combination of historical and current pricing to determine replacement value by asset type/design. Where insufficient historical or current pricing is available for an asset type/design, a combination of equivalent asset pricing data and estimation averaging has been used to determine a prudent replacement value with consideration to operational needs and fit-for-purpose design elements of the asset.

Life cycle strategies have been applied on an asset level to form the foundation of the model profile.

Additional shaping, smoothing, bulk procurement savings and asset extended life profile assessment were used to develop expenditure profiling with prioritisation to regulatory compliance.

¹ Saving lives on country roads, <https://towardszero.nsw.gov.au/campaigns/countryroads>, (accessed November 2022).

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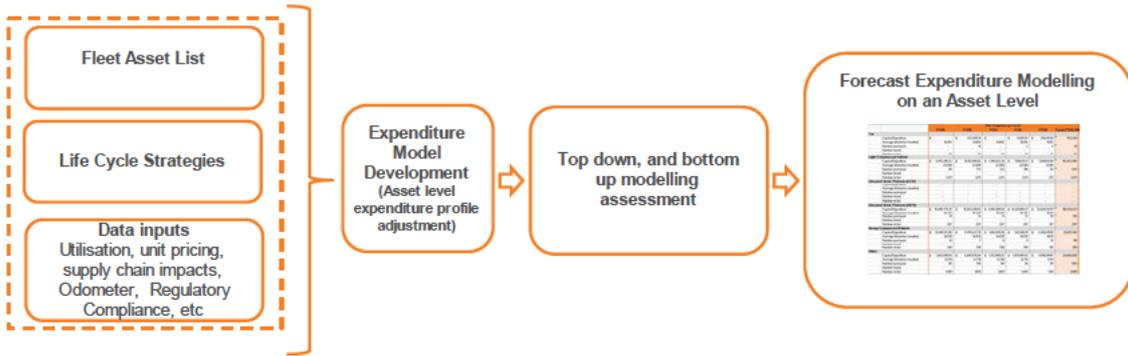


Figure 2 - Capex Model Methodology

3.2.2 Investment Profile Comparison

Generally, the life cycle strategy for crane borer vehicles and plant forecasts a planned operational service life of 20 years, with the plant undergoing a refurbishment at Year 10. However for some crane borer assets, a shorter life of 15 years is necessary due to manufacturer time of purchase design life (see “10.08.05 Fleet crane borer asset class strategy” for detail).

Table 2 (below) summarises the forecast crane borer replacements and refurbishments in the coming regulatory period under options 1 and 2.

			FY25	FY26	FY27	FY28	FY29	Total
Crane Borer Option 1 "Replace according to life cycle strategy"	Quantities	Replacements						
		Refurbishments						
	Capex (\$M FY24 Real)	Replacements	\$18.4	\$0.0	\$0.0	\$0.6	\$1.1	\$20.1
		Refurbishments	\$3.0	\$0.3	\$0.0	\$0.0	\$1.0	\$4.3
		Total	\$21.3	\$0.3	\$0.0	\$0.6	\$2.1	\$24.3
Crane Borer Option 2 "Stabilise and smoothen expenditure profile"	Quantities	Replacements						
		Refurbishments						
	Capex (\$M FY24 Real)	Replacements	\$12.9	\$5.5	\$0.0	\$0.6	\$1.1	\$20.1
		Refurbishments	\$3.0	\$0.3	\$0.0	\$0.0	\$1.0	\$4.3
		Total	\$15.9	\$5.8	\$0.0	\$0.6	\$2.1	\$24.4

Table 2 - Investment Profile Comparison – Crane Borers

Figure 3 (below) depicts the total crane borer capital expenditure profile in the coming regulatory period under options 1 and 2. Note that an equivalent graph depicting the capital expenditure profile for the full fleet (all vehicle categories) is provided in Appendix A. Some smoothing has been applied to Option 2, however the overall capital expenditure for the coming regulatory period for both Option 1 and 2 is equivalent due to the requirement for meeting compliance obligations.

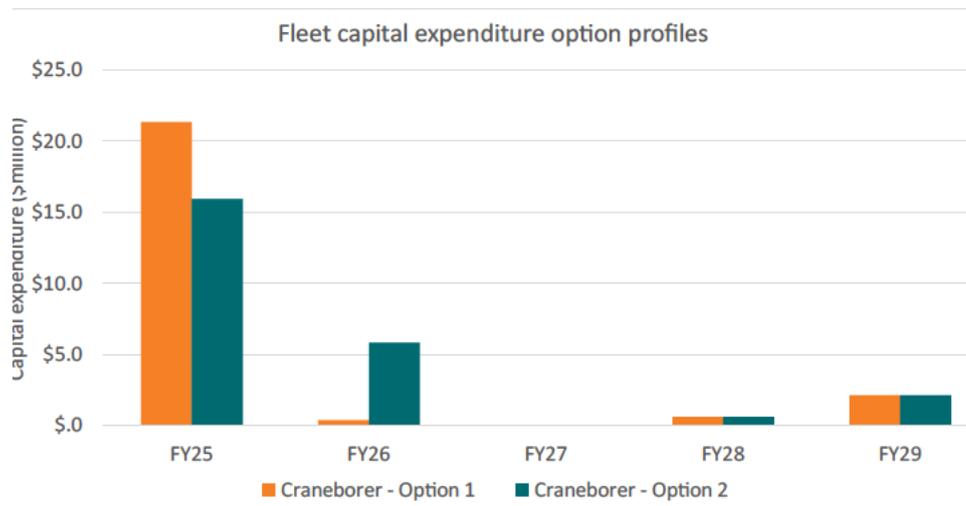


Figure 3 - Expenditure comparison – Crane Borers

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3.3. Option Comparison

A summary assessment of the considered options are described below.

	Option 1 Replace according to life cycle strategies	Option 2 (Recommended) Stabilise and smoothen expenditure profile
Overview	<ul style="list-style-type: none"> The fleet replacement program will replace assets when due, in alignment with asset lifecycle strategies. Fleet operations are forecast to continue based on the current service delivery model. Estimated operational costs are forecast based on the current fleet service delivery model with FY21 & FY22 actuals used. Operational efficiencies are forecast towards the latter part of the regulatory period. 	<ul style="list-style-type: none"> The fleet program will proceed with a progressively smoothened expenditure profile. Prioritisation of crane borer asset replacements will be based on condition assessments and compliance requirements. The fleet total expenditure profile will be incrementally stabilised to mitigate recurring historical peaks and troughs. Fleet operations are forecast to continue based on the current service delivery model. Estimated operational costs are forecast based on the current fleet service delivery model with FY21 & FY22 actuals used. Operational efficiencies are forecast towards the latter of the regulatory period.
Advantages	<ul style="list-style-type: none"> 100% of assets within operational life span during the coming regulatory period. Continued reduction in risk profile. Maximum reduction in major vehicle / plant serviceability failure rates, where expensive repairs, works disruption or unplanned disposals are required. Maximises continued reduction in asset health related incidents in line with the current trending profile – see Figure 1. 	<ul style="list-style-type: none"> Continued long term fleet asset management sustainability is achieved progressively, shifting the replacement profile, prioritising vehicles based on greatest need. Continued reduction in risk profile. Enables total capital investment smoothing and reduces peak in replacement. Improved reliability and asset performance through progressive replacement of aged fleet assets. Reduction in major vehicle / plant asset serviceability failure rates, where expensive repairs, works disruption or unplanned disposals are required. Enables continued reduction in asset health related incidents in line with the current trending profile see Figure 1.
Disadvantages	<ul style="list-style-type: none"> Higher peak forecast capital investment. Continued recurring peak and trough expenditure profile cycles. These peak and troughs reduce the effectiveness of cyclic asset management practices. Delivery schedule is highly dependent on supply chain uptake and rebound from pandemic impacts. 	<ul style="list-style-type: none"> Increase in asset compliance management resourcing to shift expenditure within compliance requirements. Delivery schedule is partially dependent on supply chain uptake and rebound from pandemic impacts.
Key Risks	<ul style="list-style-type: none"> Delivering this fleet replacement program requires some program management coordination, including structured procurement and deployment management. Significant impact of supply chain availability and rebound from constraints introduced as a result of pandemic and global events. 	<ul style="list-style-type: none"> Delivering this fleet replacement program requires greater program management coordination, including structured procurement and deployment management. Partial impact of supply chain availability and rebound from constraints introduced as a result of pandemic and global events.
Expenditure	<ul style="list-style-type: none"> Opex: \$12.4m* Capex: \$24.3m Totex: \$36.7m 	<ul style="list-style-type: none"> Opex: \$12.4m* Capex: \$24.4m Totex: \$36.8m
NPV	-\$26.1m	-\$26.1m

*carrier operational costs included as part of heavy commercial vehicle investment case

Table 3 - Options assessment

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The above NPV comparison has been performed using the NPV calculation workbook, with the following parameters.

- Discount Rate: 2.74% (Regulated Post-tax Real)
- Company Tax Rate: 30%
- Investment Modelling Period: 10 years
- Asset Life, Refurbishment Life: 10 years

3.4. Program Risks

Risk	Inherent Risk	Planned Mitigation	Residual Risk
R01. The fleet replacement program represents a significant set of interdependent activities which could result in delays or cost overruns if inadequately coordinated.	High	<ul style="list-style-type: none"> • Delivering the fleet replacement program requires structured procurement and deployment management. • Program / project management methods, rigour and expertise will be applied with appropriate senior leadership governance oversight. • Asset lifecycle assessment/acquisition and refurbishment points implemented with suitable lead times based on current and projected supply chain delays. 	Medium
R02. Continued operation of an aging fleet and plant with inadequate controls could result in serviceability, reliability and safety issues, with a consequential impact on customer service delivery.	Medium / High	<ul style="list-style-type: none"> • In both options, vehicles and plant will be replaced in order of priority. In the meantime, strict maintenance and inspection processes will continue to be applied and improved upon to ensure serviceability and safety. • In the case of Option 2, some assets will continue to operate outside of the operation life cycle strategies. However, vehicle and plant maintenance and inspection processes will ensure serviceability and safety as well as compliance with legislative requirements and manufacturers' specifications. 	Low

Table 4 - Risks

3.5. Benefits

Business benefits associated with the proposed options are summarised below.

Benefit area	Description	Value	Applicable options	
			Option 1	Option 2 (Recommended)
Tangible quantifiable	Asset health related incident rate	Per mil. km	✓✓	✓✓
	Emission reductions	CO ₂	✓	✓
	Supporting continued improvement of driver behaviour through vehicle technology implementation	Vehicle Score	✓	✓
Intangible / unquantified	Fit-for-purpose assets supporting operational efficiencies and environmental operating conditions	Performance	✓	✓
	Reduction in driver risk profile through asset design	Health and Safety	✓	✓
	Mitigating exposure to supply chain constraints	Performance	✓	✓✓

Table 5 - Benefits

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3.6. Organisational Impacts

The table below summarises the key organisation impacts associated with the program delivery.

Business area	Impact	Impact rating
Fleet management team	Continued enhancement of mobile asset management systems and processes.	Medium
All operational business areas	Continued change management of fleet technology and systems	Low
Drivers and operators	Education / orientation regarding operation of new replacement vehicle models, plant and changes in technologies. Education of changing legislative requirements and duties.	Low

Table 6 - Impact assessment

3.7. Key Constraints

Constraints which may affect delivery of the initiative include:

- Capacity of the market to deliver replacement vehicles and plant consistent with the planned timeframe.
- Development and changes in technologies and the industry
- Continued global and environmental events impacting supply chain.

3.8. Key Dependencies

Delivery of the asset management and replacement may depend on the following:

- Continued enhancement of mobile asset management systems and processes.

3.9. Key Assumptions

Assumptions underpinning this investment case include:

- Some disruption in supply chains will continue into the coming regulatory period, however the market will progressively recover enabling capacity sufficient to realise expenditure profile
- Estimated capital and operational costs are forecast based on currently available data.

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Appendix A – Total fleet expenditure profile (all vehicle categories)

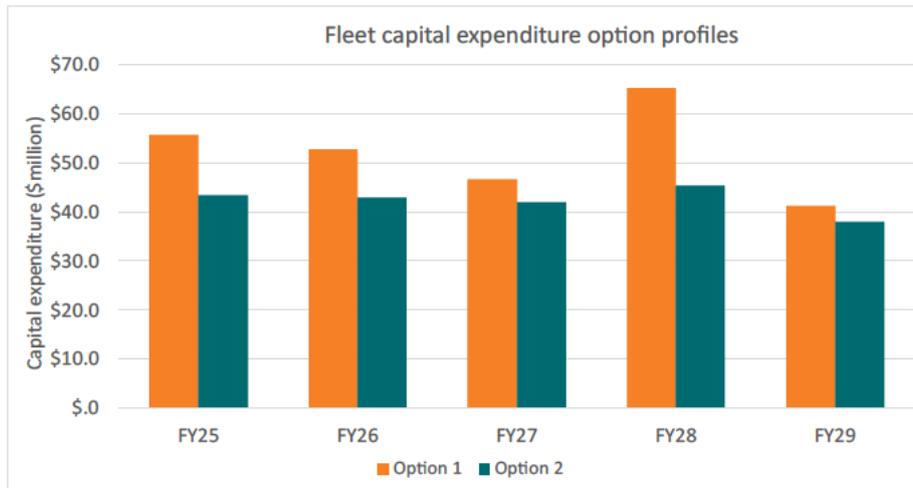


Figure 4 - Expenditure comparison – Total Fleet (all vehicle categories)