



From
the People of Japan



Climate Action Pathways for Island Transport (CAP-IT) Samoa Decarbonisation Strategy for Samoa's Transport Sector until 2030

Final Report November 2024

Foreword by CEO MWTI

I am pleased to present the Decarbonisation Strategy for Samoa's transport sector until 2030.

It has been a privilege leading the Sector as it embarks on its journey to develop its pathway towards a lower carbon future. It is a work to be proud of as this Strategy is one more tool that will help propel us to meet our obligations as mandated by the Pathway for the Development of Samoa (PDS) FY2021/22 – 2025/26.

I sincerely thank the various Chief Executive Officers and government officials involved for their efforts and foresight which have shaped the Strategy.

Throughout this undertaking, our goal was to ensure alignment of the Strategy's direction to the PDS, and Samoa's Second Nationally Determined Contributions (NDCs), with clear targets for specific emissions reductions by 2030, including in the area of transport.

Transport, in all its modes, is a vital part of our development agendas at all levels as it is the central enabler of connectivity. It allows access for trade, employment, education and health care and at the same time delivers a sustainable transportation agenda that can manage our environmental footprint.

There is no greater challenge confronting the global community than that of climate change caused by greenhouse gas emissions. It is time for action and we must shoulder our collective responsibilities. We believe that assurance of connectivity, and accessibility is the key to empowering communities, building resilience, and inspiring growth to elevate the quality of life for all.

This Strategy reflects our commitment for the next six years as well as preparations for continuing the transition to a lower-carbon transport future. The Strategy includes legislation with relevant policy changes, financing initiatives and interventions to support the mobility needs of our societies. These will be carried out in a manner that will have the least damaging impacts on the environment and at the same time enhance the mobility of future generations.

The implementation will be faced with challenges but I believe we have come a long way. A holistic approach has been taken with government officials, the private sector, communities and development partners all coming together in a collaborative manner to take us to where we are. In that regard, I believe we will continue to do so passionately and implement this Strategy successfully.



Fui Tupa'i Mau Simanu



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This report was produced by KVA Consult Ltd, Flow Transportation Specialists Ltd and Foreseeable Ltd for the Samoa Ministry of Works, Transport and Infrastructure as part of the UNDP Climate Action Pathways for Island Transport (CAP IT) project, funded by the Government of Japan.

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List of Acronyms

CAP-IT	Climate Action Pathways for Island Transport
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
e-	Electric (e.g., e-bus)
EIA	Environmental Impact assessment
EPC	Electric Power Corporation
ESS	Environmental and Social Safeguards
EV	Electric Vehicle
GHG	Greenhouse Gas
Gg	Gigagram (1 million kilogrammes)
GoS	Government of Samoa
ICE	Internal Combustion Engine
kW	Kilowatt
kWh	Kilowatt-hour
LTA	Land Transport Authority
MNRE	Ministry of Natural Resources and Environment
MOF	Ministry of Finance
MWCSD	Ministry of Women, Community, and Social Development
MWTI	Ministry of Works, Transport, and Infrastructure
NDC	Nationally Determined Contribution
PPS	Petroleum Products Supplies Ltd

SAA	Samoa Airport Authority
SMP	Sustainable Management Plan
STA	Samoa Tourism Authority
UNDP	United Nations Development Programme

Acknowledgements

The authors thank the representatives of the following organisations and acknowledge their assistance in preparing this strategy.

Electric Power Corporation
Land Transport Authority
Ministry of Customs and Revenue
Ministry of Finance
Ministry of Natural Resources and Environment
Ministry of Police, Prisons and Corrections Services
Ministry for Public Enterprises
Ministry of Works, Transport, and Infrastructure
Ministry of Women, Community, and Social Development
National University of Samoa
Office of the Regulator
Samoa Airport Authority
Samoa Fire Emergency Services Authority
Samoa Qualifications Authority
Samoa Shipping Services
Samoa Tourism Authority

1. 'Oto'otoga o Mataupu Taua

O le faatinoina o lenei Taiala Alualu Mamao i le 2030 ua faatusaina lona tau e i le va o le \$67 miliona ma le \$95 miliona talā Amerika e sili atu ai nai lo le tau masani o galuega faatino ma faasaoina ai vaega tupe i le va o le \$77 miliona ma le \$105 miliona talā Amerika i totonu o le 10 tausaga, ae o loo faaitiitia ai le puaina atu o le kasa e afua ai le vevela o le ea i le tausaga mai femalagaa'iga mai le 13% i le 18% (faatusatusa i le tausaga 2022), faatasi ai ma faamanuiaga i tulaga tau i le siosiomaga, soifua maloloina ma faigofie ona maua avanoa mo Samoa.

“O le faaitiitia ole kasa kaponi” o lona uiga o le suia lea o suauu uma e gaosia mai i le kaponi (faata'ita'iga o penisini, ma le tiso) i punaoa o malosi'aga e aunoa ma le kaponi (faata'ita'iga o eletise mai le la, savili ma le suavai) ina ia faaitiitia kasa e faaleagaina ai le ea ma mafua ai suiga o le tau. O suiga ole Tau e aafia ai tagata i le lalolagi atoa. O le siisii ole vevela e mafua ai lāmala, o le siisii ole maualuga o le suasami e avea ma faamata'u i ogaeleele tu maualalo, ma o le faatupula'ia pea o tulaga ogaoga o le tau e oo ai ina tulai mai faalavelave ogaoga ma le matautia. O Fela'uai'ga e telē lona sao i suiga o le tau i le lalolagi atoa ma e tusa ma le 27% o le kasa e afua ai le vevela o le ea mo Samoa o loo fai sao ai i suiga ole tau.

O le suia o felauaiga i auala e maualalo le malosiaga mai le suauu e fa'aaogaina ai (o se auala o felauaiga e maualalo le puaina o kasa e vevela ai le 'ea) e auala mai ai faamanuiaga e tele mo Samoa. O ia vaega e tapena ai Samoa mo le lumanai e ala i le:

- Faasaoina o tupe i le tau o suauu e faaulufaleina mai ma faamalosiaga le tulaga tutoatasi i manaoga tau malosiaga.
- Maua avanoa e filifili ai i galuega, aoaoga, faleoloa ma auunaga faa soifua maloloina.
- Tuuina atu se sao i 'suiga amiotonu" mo faamasinoga talafeagai ma tulaga tutusa i gaioiga i le suiga o le tau ina ia mautinoa e lē avea galuega mo le faaitiitia o aafiaga ma auala e atili siitia ai le lē tutusa o avanoa a ia manuia tutusa tagata uma, e aofia ai tamaitai, talavou, tagata matutua ma tagata e i ai aafiaga tumau o le soifua.
- Ia faaleleia le tulaga lelei o le ea, lelei auala e fegasoloai ai faapea tauunuuga o le soifua maloloina o tagata.
- Ia faamalosiaga tulaga taualoa o Samoa o se nofoaga mo tagata tafafao maimoa mai fafo e mamā ma lanumeamata

Lagolago ina ia ausia e Samoa a na matati'a mo le faaitiitia o aafiaga o suiga o le tau e fesootai ma le Maliega i Pale ma taumafaiga aoaotetele a le lalolagi ina ia tali atu i suiga ole tau.

O le itulau o loo i lalo ua oto'otoina atu ai le Faatulagana o le Taiala Alualu Mamao e 'auga i le saogalemu, aofia o tagata uma, soifua maloloina lelei, ma le vaega ma'oti o Fela'uaiga e matua gafataulimaina.

O le fa'aaauaaina o le tu'uitiitia o le kasa Kaponi i auala o fela'uaiga i luga o le Laueleele ma le gataifaleina ia faamalosia fesootaiga, faigofie ona maua e ala i 'au'aunaga tau fela'uaiga mautu ma ia malu puipua le mafai ona tali atu o galuega tetele ma atina'e o Laueleele ina ia si'itia le tulagalelei o le soifuaga mo tagata uma.

la faaitiitia ile 18% le tulaga maualuga i le 2022 o le kasa e afua ai le vevela o le ea e puaina mai i fela'uaiga (25Gg CO2 -e) i le 2030



Ta'avale eletise ma ta'avale alu ile eletise ma le suauu

Faaleleia auala o femalagaiga faalauaitete

Ala savali ma ala mo uila vilivave

Uila eletise

Fela'uaiga ile gataifale e maualalo le kasa e puaina atu

Femalagaiga fefa'asoa'i

Fuafuaga tau pulega gafataulimaina

Au'aunaga pasi mo a'oga

Lelei feso'ota'iga ile initaneti



Faiga faavae ma tulafono faatonutonu



Fa'aleleia o galuega tetele



Faatosina tau tupe



Tekonolosi ma faiga fou



Eletise saogalemu mo le siosiomaga



Aganu'u, gafatia, ma agavaa

SAOGALEMU MA AOFIA AI

Ia mautinoa le saogalemu ma le aofia o tagata uma

GAFATAULIMAINA

Fa'ataua matafaioi tausimea ma le mafau fau mamao

FAANATINATI

Gaoiiga faanatinati e fo'ia ai le tele o le kasa kaponi e puaina atu

VAAI AOAOTETELE

Fa'afeso'otai auunaga o felauaiga ma isi auunaga aloa'ia

MAFAI ONA SUI MA GAFATIA ONA TALI ATU

Mafai ona fetuutuunai ma tali atu i suiga

O le Taiala Alualu Mamao a le Vaega Ma’oti o Felauaiga a Samoa mo le Tuutiitia o Kasa Kaponi e oo atu i le 2030, o loo uuna’ia felauaiga e maualalo le faaogaina o le kaponi ina ia saofagā ai i taumafaiga aoatetele a le lalolagi e faaititia aafiaga o suiga o le tau. O loo tuuina atu mo taitai o Samoa ni fesoasoani e filifili ai auala talafeagai ma taugofie e faaititia ai le puaina atu o kasa oona e faaleagaina ai le siosiomaga ma faatino ai a latou Tautinoga mo le Tau.

O loo faataatia atu e le Taiala Alualu Mamao se ālafua e 13% ile 18% e faaititia ai kasa oona e faaleagaina ai le siosiomaga (GHG) mai le vaega o Fela’uaiga e oo atu i le 2030 fuafua i le 2022, ma fa’aaau ai pea ona tuutiitia kasa oona e faaleagaina ai le siosiomaga e agai atu ile lumanai.

O le poloketi o Alāfua o Gaioga o le Tau mo Felauaiga i Atumotu (CAP-IT) a le Faalapotopotoga o Malo Afaatasi o loo lagolagoina manulauti a Samoa e u’unaia ai ituaiga felauaiga e maualalo le kasa e afua ai le vevela o le ea ia aofia ai tagata uma, avanoa mo tagata uma ma gafataulimaina.

E aofia ai le fausia o pulega e amanaia manaoga o tagata uma ma ia faaleleia tomai faapitoa ma agavaa i le faafoeina o tupe ina ia ausia le Saofaga Manaomia Lautele (NDC) lona lua a Samoa ma faatelevave suiga o felauaiga i le laueleele ma le sami i auala e maualalo le kasa e puaina atu.

Taunuuga Moomia:

O le faatinoina o le Taiala Alualu Mamao mai le 2025 i le 2030 ua faamoemoe e ‘ausia ai Taunuuga e pei ona faalia i le ata 1.1.

Ata 1.1 Taunuuga Moomia i le 2030:

Ālafua	Taunu’uga Mo’omia
Fa'aitiitia kasa CO ₂ e i le tausaga i le 2030 fa'atatau i le 2022	18 - 25 Gg
Vaega o le Lipoti Lona Lua a Samoa mo Saofaga Manaomia Lautele (NDC) o le Vaega Ma’oti o Malosiaga mo le faaitiitia o le CO ₂ e	34% - 47%
Fa'aitiitiga faaletausaga o kasa CO ₂ e o Fela’uaiga mai le laasaga o le 2022 i le 2030	13% - 18%
Tupe Fa'asao Faaletausaga mai le Fa'agaioiina o Galuega	US \$10 miliona
Faamanuiaga Faaopoopo	Fa'aleleia tulaga tutusa, Aofia tagata uma, maua avanoa. Fa'aleleia le Soifua Mālōlōina Si'osi'omaga Sili Atu ona Lelei Fa'aleleia le Saogalemu ma le Puipuiga o Fela’uaiga

Faatupeina o Galuega ma Faamanuiaga tau Tupe

O le tupe faavae e moomia mo le faatinoina o le Taiala Alualu Mamao ua fuafuaina pe tusa o le \$146 miliona i le \$234 miliona talā Amerika (fua faatatau o le aofaiga e laugatasia ai e \$24 miliona i le \$39 miliona i le tausaga). E tusa lea ma le \$63 miliona i le \$100 miliona e maualuga atu ai i le tau e masani ai pisinisi mo le toe suia o taavale tuai i nisi taavale pisinisi ma le tiso.

I totonu o le 9 tausaga o le fa'aaogaina faasoloatoa (tusa ole 2039), e faamoemoe e sili mamao atu tupe faasao mai suauu nai lo o le tau o tupe faavae faafaigaluega.

E le gata i lea ae o le a fanau mai i le Taiala le tele o nisi faamanuiaga e pei o avanoa tutusa, saogalemu, o le siosiomaga, ma le soifua maloloina lautele i Samoa.

Faatinoina o le Polokalame

O le faatinoina o le polokalame o loo fuafuaina i vaega e tolu:

- Gaoioiga Mo se Vaitaimi Puupuu (2025-2026) e aofia ai suesuega ma sailiga pe talafeagai, faatinoga faa-faataitaiga, suiga faaletulafono ma faiga faavae, ma le faamautuina o punaoa o alagatupe.
- Gaoioiga mo se vaitaimi Faaleogalua (2027-2030) e aofia ai fuafuaga mo le faaofiina mai o taavale e maulalo kasa puaina atu ma le faaleleia o galuega tetele.
- le Vaaiga Alualu Mamao (tua atu ole 2030) ua mamauina ina ia ausia taumafaiga fa'aaauau e agai ile matuā leai o se kasa kaponi, ausia avanoa tutusa, ma ia aofia tagata uma i le Vaega Ma'oti o Felauaiga.

Mataitūina, Lipotia ma le Iloiloina

O le pulega, e aofia ai ma le mataitūina o faatinoga o le Taiala, o le a ō gatasi ma le faataatiaga o le Fuafuaga Alu Mamao a le Vaega Ma'oti o Fela'uaiga ma Galuega Tetele i le taimi nei. O loo fuafuaina alafua faaopopo ina ia mafai ai ona matua mata'itūina lelei le faatinoga ma taunuuga o le Taiala.

1. Executive Summary

Implementing this Strategy by 2030 is estimated to cost between US \$67 million and \$95 million above business-as-usual activity and deliver savings of between US \$77 million and \$105 million over ten years, while reducing the annual GHG emissions from transport by 13 % to 18 % (compared to 2022), with co-benefits to Samoa's environment, health and accessibility.

Decarbonisation means replacing carbon-based fuels (e.g. petrol and diesel) with non-carbon energy sources (e.g. electricity from solar, wind, and hydro) to reduce the greenhouse gases (GHGs) that pollute our air and cause climate change. Climate change affects people all over the world. Rising temperatures cause droughts, rising sea levels threaten low-lying regions, and increasing extreme weather leads to severe disruptions. Transport is a large contributor to climate change globally¹ and is responsible for 27 % of Samoa's GHG emissions that contribute to climate change.

Shifting to a transport system that uses less fossil fuels (a low-emission transport system) presents many benefits for Samoa. These prepare Samoa for the future by:

- saving money on the cost of imported fuel and becoming more energy-independent
- providing better choices to access jobs, education, shops, and healthcare
- contributing to a “just transition” for social justice and equity in climate action, by making sure mitigation efforts do not further

increase social inequality but benefit everyone equally, including women, youth, the elderly, and persons with disabilities

- improving air quality, active mobility options and health outcomes of the people
- enhancing Samoa's credentials as a green tourism destination.
- contributing to reaching Samoa's mitigation targets aligned with the Paris Agreement and the global efforts to tackle climate change.

The Decarbonisation Strategy for Samoa transport sector until 2030 (Strategy) promotes low-carbon transportation to contribute to global efforts to reduce the impacts of climate change. It provides Samoa's leaders with tools to choose practical and affordable ways to reduce GHG emissions and deliver on their climate commitment. The strategy sets out a pathway to a 13 % to 18 % reduction in GHG emissions from the transport sector by 2030 compared to 2022, with continued reductions in GHG emissions thereafter.

The UNDP Climate Action Pathways for Island Transport (CAP-IT) project supports Samoa's goals by promoting a low-emission transport system that is inclusive, accessible, and sustainable. This involves building strong gender-sensitive governance and improving technical and financial capability to achieve Samoa's second NDCs and speed up the shift to low-emission land and sea transport.

The following page summarises the Strategic Framework that will lead to a safer, more inclusive, healthier and more sustainable transport sector.

¹ <https://www.ipcc.ch/report/ar6/wg3/chapter/chapter-10/>






VISION

The sustainable decarbonisation of the land and maritime transport sectors to deliver strengthened connectivity, with eased accessibility through secured transport services and safeguarding the resilience of infrastructural and land developments to elevate the quality of life for all

TARGET

18% reduction from the 2022 levels of GHG emissions from the transport sector (25Gg CO₂-e) by 2030

STRATEGIES

EASY ACCESS	GET ACTIVE	MODERNISING PUBLIC TRANSPORT	SMART ELECTRIFICATION	GREENER TOURISM
 <p>Reducing travel to access services through greater use of digital connectivity and longer-term land use changes</p>	 <p>Integrating physical activity in our everyday life, through walking or cycling as a means of transport</p>	 <p>Upgrading buses and services to promote low-carbon travel</p>	 <p>Targeted adoption of electric vehicles with careful planning and integration with the electricity network</p>	 <p>Leveraging the tourism sector's unique characteristics to kick start low carbon transport modes</p>

INTERVENTIONS

Electric and hybrid vehicles	Electric bikes	Sustainable management plans
Improved public transport	Low emission maritime transport	School bus services
Walking and cycling paths	Shared mobility	Better digital connectivity

ENABLERS

 Policy and regulation	 Infrastructure improvements	 Financial incentives	 Technology and innovation	 Greener and stable electricity	 Culture, capacity and capability
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PRINCIPLES

<p>SAFE & INCLUSIVE</p> <p>Ensuring safety and inclusiveness for all users</p>	<p>SUSTAINABLE</p> <p>Emphasising stewardship and long-term thinking</p>	<p>URGENT</p> <p>Prompt action to avoid more carbon emissions</p>	<p>HOLISTIC</p> <p>Integrating transport with other systems</p>	<p>ADAPTIVE & RESILIENT</p> <p>Being flexible and resilient to changes</p>
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Expected Outcomes

Implementation of the Strategy between 2025 and 2030 is expected to deliver the outcomes shown in Table 1.1.

Table 1.1 Expected Outcomes in 2030

Measure	Expected Outcome
Annual CO ₂ e emission reduction in 2030 compared to 2022	18 Gg to 25 Gg
Proportion of Samoa's 2 nd NDC Energy Sector CO ₂ e reduction	34 % to 47 %
Annual Transport Sector CO ₂ e reduction from 2022 level in 2030	13 % to 18 %
Annual Operational Cost Savings	US \$10 million
Co-Benefits	Improved Equity, Inclusion and Access Improved Health Better Environment Improved safety and security of transport

Financial costs and benefits

The capital investment required to deliver the strategy is estimated to be between US \$162 million and \$222 million (average \$27 million

to \$37 million per year). This is about \$67 million to \$95 million above the business-as-usual costs of replacing ageing vehicles with other petrol and diesel ones.

Over 9 years of full operation (i.e. by 2039), fuel savings are expected to outweigh the investment cost.

In addition, the strategy will yield unquantified benefits to equitable accessibility, safety, the environment and public health in Samoa.

Delivery Programme

Delivery of the Strategy is proposed in three stages:

1. Short-term actions (2025-2026) including feasibility studies, pilot trials, regulatory and policy changes and securing funding sources
2. Medium-term actions (2027-2030), including the targeted introduction of low-emission vehicles and infrastructure improvements
3. The Long-term vision (post-2030) is designed to achieve ongoing progress towards a zero-carbon, equitable, and inclusive transport sector.

Monitoring, Reporting, and Evaluation

Governance, including monitoring the implementation of the strategy, will align with the current arrangements for the Transport and Infrastructure Sector Plan. Additional Key Performance Indicators are proposed to specifically monitor the implementation and outcomes of the strategy.

2. Why have a Decarbonisation Strategy?

Climate change affects lives around the world. Rising temperatures cause droughts, rising sea levels threaten low-lying regions, and increasing extreme weather leads to severe disruptions. Through burning fossil fuels to power vehicles, transport is a large contributor to climate change globally and makes up around 27 % of Samoa's GHG emissions that feed global warming and lead to climate change.

Samoa's 2nd Nationally Determined Contribution (NDC) submission to the United Nations Framework Convention on Climate Change set Samoa's target reductions in CO₂e emissions for various sectors. For the energy sector, which includes transport, the target is a 30 % reduction compared to 2007 levels, or 53 Gg CO₂e per year, by 2030.

Shifting to a transport system that uses less fossil fuels (a low-emission transport system) presents many benefits for Samoa. These prepare Samoa for the future by:

- saving money on the cost of imported fuel and becoming more energy-independent
- providing better choices to access jobs, education, shops, and healthcare
- contributing to a “just transition” for social justice and equity in climate action, by making sure mitigation efforts do not further increase social inequality but benefit everyone equally, including women, youth, the elderly, and persons with disabilities
- improving the air quality, active mobility options and health outcomes of the people

- contributing to reaching Samoa's mitigation targets aligned with the Paris Agreement and the global efforts to tackle climate change.
- enhancing Samoa's credentials as a green tourism destination.

The Strategy considers how to improve the safety, efficiency, and inclusivity of Samoa's transport system to provide transport options for all users, including women, the young and elderly, people with disabilities, and low-income households.

Associated benefits of a lower carbon transport system include health benefits, better air quality, lower noise, and better provisions for active modes such as walking and cycling. There are also benefits to Samoa's environment from reduced air and water pollution, benefits to the tourism industry by providing greener transport options for visitors, and economic benefits from reduced reliance on imported fossil fuels and better access to jobs and markets.

The Strategy promotes carbon-neutral mobility to help stop climate change. It provides Samoa's decision-makers with tools to select GHG mitigation measures that deliver on their climate commitment.

This Strategy has been prepared by the KVA Consult / Flow Transportation Specialists / Foreseeable team contracted by the UNDP to undertake the selected activities implemented under the Climate Action Pathways for Island Transport (CAP-IT): Accelerating the Decarbonisation of Samoa's Land and Maritime Transport Sectors project. This report covers Activity 1.3 of CAP-IT Output 1, which requires the production of a gender-responsive multi-dimensional Decarbonisation Strategy for Samoa's transport sector until 2030.

3. Samoa’s Transport Sector Overview

3.1 Existing Plans, Policies and Strategies

This Strategy complements existing strategies, policies, and plans as shown in Figure 3.1 that together will provide the pathway to decarbonisation of the transport sector in Samoa.



Figure 3.1 Related Strategies, Policies and Plans

These relevant documents have been studied in the preparation of this Strategy.

Pathway for the Development of Samoa (PDS) (2021/22–2025/26) is Samoa’s national 5-year plan to guide Samoa’s sustainable development initiatives. The Key Priority Areas in the PDS which are relevant to decarbonisation in land and maritime transport are KPA

18: Sustainable energy development enhanced under Key Strategic Outcome (KSO) 4: Secured environment and climate change and KPA 19: Responsive Public Utility Services under KSO 5: Structured public works and infrastructure.

Samoa’s First Biennial Update Report (2023) outlines the country's efforts to address climate change, with a focus on strategies to decarbonise the transport sector. Key strategies include promoting the adoption of electric vehicles (EVs) and outboard motors, enhancing infrastructure to support EVs, and conducting feasibility studies and large-scale demonstrations to build capacity and readiness for a nationwide transition to electric mobility. These initiatives aim to reduce the reliance on fossil fuels and support Samoa's enhanced Nationally Determined Contribution (NDC) for the energy and transport sectors by 2030

Samoa’s Second Nationally Determined Contribution Implementation Roadmap and Investment Plan (2021) Samoa aims to reduce overall GHG emissions by 26 per cent in 2030 compared to 2007 levels (or by 91 Gg CO₂e compared to the new reference year once Samoa’s GHG emissions inventory has been updated). The specific mitigation target for the Energy sector is to reduce GHG emissions by 30 per cent in 2030 compared to 2007 levels (or by 53 Gg CO₂e compared to the new reference year once the GHG emissions inventory is updated).

Samoa National Policy on Gender Equality and Rights of Women and Girls (2021-2031) was developed by the Ministry of Women, Community and Social Development (MWCSO) in Samoa. It sets the pathway of the county to reach gender equality and promote women’s empowerment through 7 priority areas, including

Infrastructure and Transport. In regard to this sector, it recommends ensuring that all transport and infrastructure planning incorporates gender analysis, developing specific mechanisms for stronger engagement of women in consultation and decision-making in all aspects of infrastructure including urban planning and development, and ensuring that programmes are designed with the safety of women and other groups in mind.

Transport and Infrastructure Sector Plan (2022/23–2027/28) sets the transport and infrastructure sector pathway and its contribution to the development of Samoa over the next five years. The Transport and Infrastructure Sector Plan aims to achieve “Strengthened connectivity, with eased accessibility through secured transport services and safeguarding the resilience of infrastructural and land developments to elevate the quality of life for all” by 2028.

Samoa Energy Sector Plan (SESP) (2023/24–2027/28) was developed by the MoF as the lead agency in collaboration with all energy sector stakeholders. The five-year SESP sets out the government's vision, underlying theme, policies and strategies to ensure that Samoa has a reliable, affordable and sustainable supply of energy that meets the needs of its people and economy. The Plan also supports the transition to the Renewable Energy goal as set out in the Pathway for the Development of Samoa (PDS), which aims to achieve 70% renewable energy usage by 2031. The Plan includes a target for 82% renewable electricity generation by 2028 (Activity 1.2.1).

Low Emissions Development Strategy (LEDS) (2022-2032) is aligned with Samoa’s First and Second Nationally Determined Contribution (NDC) Plan. The LEDS is an update of the Greenhouse Gas Abatement

Strategy 2008-2018 the strategic actions that are highlighted in LEDS were an outcome of a review of existing policies and strategies to reduce greenhouse gas emissions in Samoa as well as stakeholder consultations.

Apia City Spatial Plan 2014 is a strategic framework which aims to transition Apia into a more resilient, climate-proofed city by setting the scene for future development and management. The CSP is a long-term plan spanning 50 years which aims to support the long-term Vision of the Samoa National Urban Policy 2013 for a Sustainable, Resilient and Inclusive City.

Apia City Development Strategy 2015 sets out the strategic blueprint for land use planning, development, and environmental management decision-making within the confines of Apia. It includes the creation of Sustainable Management Plans (SMPs) that will oversee and direct future land use and development, thus informing decision-making processes within the city area.

Apia Waterfront Plan is a strategic document that guides government planning and waterfront users on future development, outlining an agreed vision for the development and the use of the waterfront in Apia, Samoa.

Samoa National Urban Policy (2013) establishes the framework for a comprehensive long-term strategic plan for urban development, growth, and transformation. This policy outlines the direction for Apia's development, focusing on urban planning strategies, land management, and enhancing essential infrastructure and public amenities. The National Urban Policy aims to mitigate the adverse effects of urban growth and development, including challenges related to land use and settlement patterns.

Samoa Climate Change Policy 2020 was prepared to outline policy actions and interventions to meet the targets set out in the 2015 Paris Agreement on Climate Change as well as the Sustainable Development Goals. The policy is valid from 2020-2030 and focuses on establishing effective governance frameworks, implementing adaptation and mitigation measures, enhancing sustainable climate finance, mainstreaming climate change into national planning, improving data management, strengthening coordination, and promoting awareness and advocacy on climate change issues.

3.2 Current State of Transport in Samoa

This Strategy only covers land transport and public marine transport. Another CAP-IT activity covers small reef interisland fishing and transport, while outer reef fishing, international shipping and air transport are not in the CAP-IT programme scope.

3.2.1 Land Transport

The Samoan road network is well-developed though variable in quality, with the main system traversing the coast of both main islands at close to sea level and with a small number of cross-island roads on Upolu traversing inner-island mountains. Trips within the urban and business areas of Apia and Vaitele are relatively flat and likely to be short at less than 20 km round trip, while residential housing areas are situated towards the hills. There is a need to complete a formal travel survey to confirm distances and frequencies of travel distances. The longest round island journey on both Upolu and Savai'i would be around 200 km.

There were about 30,000 registered motor vehicles in Samoa in 2023, compared to about 20,700 registered in 2013 (LTA 2024). This amounts to an almost 50 % increase in vehicles on Samoa's roads in 10 years. During this period, Samoa's population increased from approximately 200,000 to 225,000, a 12 % increase². The existing database cannot provide disaggregated data on vehicle registration by Gender and the project presents an opportunity to enhance the vehicle registration system.

Between 2018 and 2022, Samoa imported an average of 3,000 cars, vans, and pickups per year. There is now 1 vehicle per 7.5 people in 2023, compared to 1 per 10 people in 2013. This remains low by international standards, for example in New Zealand there is one vehicle per 1.35 people.

The average age of the Samoan fleet is about 14 years, an older fleet than in New Zealand (just under 12 years), Australia (10 years), or the USA (9 years). This has implications for both vehicle safety and transport CO₂e emissions.

Between 2016 and 2020, Samoa imported 82 buses (excluding the 21 buses brought in for the 2019 Pacific Games), an average of 16 per year. Bus imports dropped after 2020, presumably associated with COVID-19 reduction in tourism and other activity.

3.2.2 Maritime Transport

This Strategy covers public marine transport, particularly inter-island ferries. The Samoa Shipping Corporation is a government-owned

² Based on the 2011 and 2021 Population and Household Census data

company in Samoa providing freight and passenger services between Savai'i, Upolu, and American Samoa.

The domestic waterborne navigation fleet consists of 5 ferries and landing craft between 2 and 25 years old, ranging from 300 to 1,100 gross tonnes. The most frequent and busiest service is the Upolu-Savai'i vehicle and passenger ferries that cross the 22km Apolima Strait, currently with 68 sailings per week (September 2023). The Apia - Pago-Pago service has about 20 sailings per month (March 2024) operated by MV Lady Samoa IV.

3.3 Current Emissions Profile

3.3.1 Land Transport

Samoa fuel sales data suggests that in 2022 Land Transport was responsible for the consumption of about 38 million litres of unleaded petrol (ULP) and about 20 million litres of automotive diesel oil (ADO) fuel. CO₂e emissions from land transport were estimated to be 142 Gg in 2022³.

The Samoa Transport Emissions Model (STEM), constructed for this Strategy, uses this fuel sales data and the number of registered vehicles in each vehicle class together with estimates of average annual kilometres driven (backed up by LTA odometer readings) and fuel consumption to estimate the emissions profile of land transport by vehicle class as shown in Figure 3.2. The assumptions used in building the STEM are included in Appendix B.

This shows the private fleet accounts for about 48 % of the CO₂e emissions from the land transport sector, followed by 17 % from trucks, 17 % from buses, and 9 % from taxis.

The highest CO₂e emissions per vehicle are from the wooden bus fleet, estimated at 80 tonnes of CO₂e per vehicle per year, due to their age, engine size, and high annual mileage. Trucks are estimated to produce 15 – 22 t CO₂e per vehicle per year, depending upon their size, and taxis about 7 t CO₂e. Private vehicles, on average, produce about 3 t CO₂e per annum each.

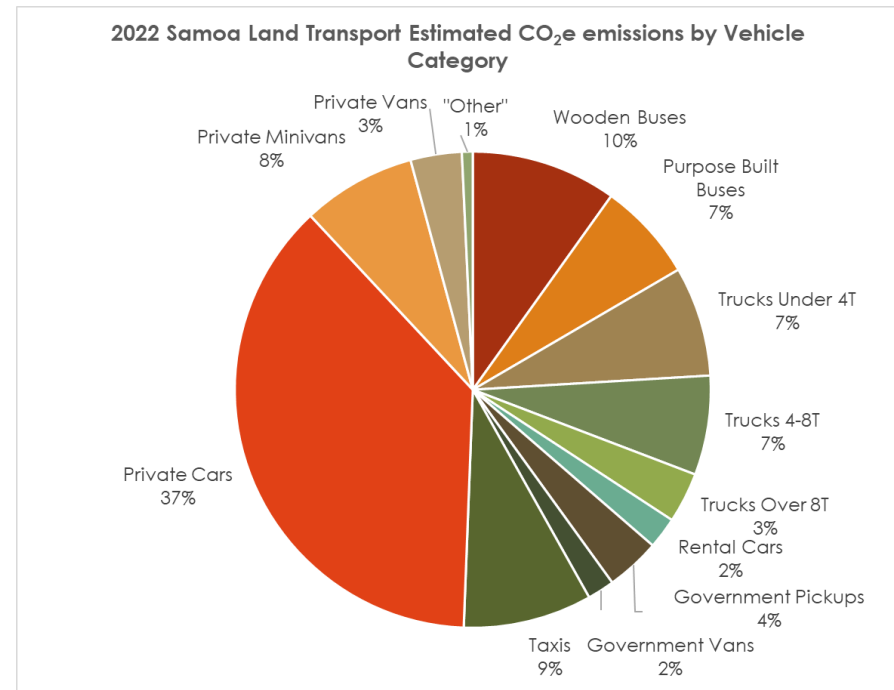


Figure 3.2 Estimated CO₂e emissions within the Samoan road transport sector 2022⁴

³ At conversion rates of 2.3 kg CO₂ per litre of petrol and 2.7 kg per litre of diesel

⁴ STEM estimate

3.3.2 Maritime Transport

CO₂e emissions from the domestic waterborne navigation sub-sector were estimated at 3.3 Gg in 2020, about 2 % of the transport sector emissions⁵. About 3,500 ferry trips are completed per year, which suggests each ferry sailing on average emits almost 1 t CO₂e, about the same as running a private car for 6 months.

3.4 Challenges and Opportunities

3.4.1 Challenges

Affordability

The transition to a low-emission transport sector is not without challenges, especially in small island developing states such as Samoa. Challenges include the cost of the transition, as low-emission technologies typically are more capital-intensive than existing technologies even though the operating costs can be lower than existing systems. Affordability is a key concern in promoting a just transition in mitigation efforts that benefits everyone, without excluding low-income households.

Increasing Car Ownership

As in many developing countries increasing wealth in Samoa has brought a desire to adopt the personal transport options (private motor cars) that are predominant in the richer nations, leading to social expectations and an increasing car ownership despite relatively high vehicle ownership costs, low annual mileage and the availability of other transport options. The absence of data on ownership by gender and by vehicle category presents an opportunity for support

to strengthen the database system and better inform targeted decarbonisation initiatives. There is a gender divide in driving licensing documented in Samoa (LTA 2024): over the 2004-2023 period, women only accounted for 25% of the new driving licenses issued, and only men accounted for the commercial (taxi) driving licenses. Even though driving licensing does not equate to car ownership, it suggests men are the primary commercial car owners.

Renewable Electricity Generation

Samoa's electricity supply is currently about 55 % generated from diesel (2022)⁶, so the conversion of the vehicle fleet to electric would not currently deliver the decarbonisation benefits that it would in countries with a higher renewable share of electricity generation. The electricity sector is planning to increase the use of renewable energy sources such as hydro, solar, and wind power. However, integrating these intermittent sources into an already strained grid presents significant challenges. The variability and unpredictability of renewable energy can make it harder to maintain a stable and reliable power supply. This Strategy assumes that electricity will be 80 % derived from renewables by 2030⁷.

Bus Operational Issues

Buses are well-used, and fares are affordable for most people however the services are slow and unpredictable, and the buses suffer from overcrowding and have few safety features. Over half of the public transport buses are second-hand imported trucks that have been converted, with wooden structures built for the passenger area. Many of these buses are over 25 years old and likely to need replacing over the next decade. As well as vehicle safety concerns,

⁵ Green House Gas Inventory Report 2010 – 2020

⁶ Samoa Energy Sector Plan FY2023/24 – FY2027/28

⁷ Based on the 82% renewable electricity target within Samoa Energy Sector Plan 2023–28 Key Strategy 2 P42.

surveys reveal driver behaviour and passenger security fears to be of concern, and we note the lack of women bus drivers.

Active Transport

Cycling and walking are not preferred methods of travel with such activities hampered by the hot humid climate, hilly topography, lack of safe walking and cycling infrastructure, poor lighting, and safety concerns including roaming dogs. Despite this, walking is the most common form of transport, even if only as a small part of a bus or car journey.

Taxis

Taxis are plentiful, but there has not been any transition to low-emission vehicles (eg hybrids) that has been widespread in other countries, with three-quarters of taxis being over 10 years old. Despite fares being set by the LTA, taxis do not use meters to calculate fares. As with buses, there are no female licensed taxi drivers.

Fuel Price

The consumer cost of transport fuel (diesel and petrol) is relatively low in Samoa compared to other Pacific Island countries, limiting the benefits of moving to low-emission vehicles.

Maritime Sector

Waterborne navigation only accounts for about 2 % of the transport sector emissions, and the cost of transitioning to new low-emission vessels is very high.

Case Study: Electric Buses in Bermuda

In 2022, the Government of Bermuda bought 30 electric buses to mitigate climate change and environmental issues as a start toward the goal of operating an entire fleet of electric public buses by 2030. 40 more electric buses arrived in 2023. The landed cost of the electric buses was reported at US \$135,000 each. In the first nine months, the Government saved an estimated US \$135K in fuel cost and saved an estimated reduction of 450 tons in the first year.

The results to date due to the introduction of the new public electric buses exceeded expectations. The Government will convert the entire fleet of public buses to electric to maximize the effect. Retiring 100 diesel buses will significantly reduce harmful emissions.

In May 2023 the Minister of Transport stated that “the introduction of the electric buses has had a significant impact on Bermuda, both environmentally and economically. The buses have reduced our carbon footprint, helped improve air quality, and have also provided a more comfortable and quieter mode of transportation for the people of Bermuda and our visitors”

In 2023 the Government of Bermuda won the Best E-Mobility Project Award at the Caribbean Renewable Energy Forum (CREF) for the progress of the electrification of the public bus fleet.

<https://www.gov.bm/articles/progress-update-new-electric-public-buses>



3.4.2 Opportunities

There are two main approaches to reducing the GHG emissions of the transport sector:

- Technology - transitioning the land and maritime vehicle fleet to lower-emission electric or hybrid vehicles, concentrating on the highest-use vehicles such as buses, taxis, and the Government fleet, combined with reducing the fossil fuel share of electricity generation.
- Reducing driving - by higher vehicle occupancy (shared mobility), mode shift to buses, active mobility such as walking and cycling including electric bikes, or by reducing the need to travel at all through land use changes and digital connectivity.

Both approaches will be necessary to achieve and sustain emissions targets. A combination of targeted transition of the vehicle fleet to low-emission vehicles and other improvements to the transport system, land use, and digital connectivity will be required. This will also help to deliver transport options that are equitable, inclusive, and accessible.

Incentivising the private sector to transition to low-emission vehicles could be achieved by a combination of tax and import duty concessions, low-interest loans, or a vehicle scrappage scheme.

Opportunities to attract investment or donor funding to enable or accelerate the transition towards a lower-emission transport system should be explored, as an investment in decarbonising projects can be attractive to companies and Governments.

The Samoa Transport and Infrastructure Plan 2023-28 includes the proposal for a new landing craft to replace Fotu-o-Samoa II, the oldest vessel in the fleet, which should be a more fuel-efficient option⁸. Existing vessels can be retrofitted with solar panels to substantially reduce in-port fuel use, while onshore terminal energy usage can be reduced by adopting more low-energy equipment and efficient operations.



⁸ The SSC has agreed a replacement diesel-powered vessel in August 2024.

3.5 Stakeholder Engagement and Partnerships

3.5.1 Key Stakeholders

Through the completion of the initial three reports and the preparation of the Strategy, targeted stakeholder engagement has been ongoing and extensive. This has involved collective workshops to identify the problems, issues, and challenges, to identify potential options for improvement of the transport sector, and to evaluate the long list of identified options.

In addition, the project team has met individually with relevant Ministries and Authorities to gather information on a range of topics relevant to the development of the Strategy. A list of stakeholders consulted is included in Appendix A.

3.5.2 Community Involvement

Two face-to-face engagement events were organised in June 2024 led by the Ministry of Women, Community, and Social Development (MWCSO). The selected districts were Falealili No. 1 & 2 in Upolu which constitute 14 villages and Faasaleleaga No. 1, 2, 3, 4, & 5 and Palauli No.1 in Savaii, represented by participants from 25 villages within these 6 districts. The two consultations were attended by 119 women which included 6 with disabilities, 121 men including 8 with disabilities, and 23 young (under 24) people (13 female, 10 male) none of whom reported having disabilities.

The report *CAP-IT Samoa Activities 1.5 and 2.3 Summary of Face-to-Face Engagement* contains a full analysis of the survey results.

Key messages and any notable differences in responses between genders or age groups arising from these consultations were:

- There is a high level of concern for the environment, with a clear understanding that transportation significantly impacts environmental quality. Young people and women cited reduced costs in the long term as a benefit of low-emission vehicles more often than men.
- Levels of concern and perceptions about the benefits of low-emission vehicles are consistent across genders. Youth (aged 18 – 24) showed a greater range of concern.
- Women use public transport (bus and ferry), and walk and cycle more, and men carpool or share a ride with others more. Men are more likely to use a private car/vehicle often or almost always than women. Young people often carpool or share a ride with others, cycle or walk.
- Women and youth are more likely to travel for shopping and to visit family and friends. Men are more likely to travel for work or business. More women have a most common trip (the number one reason for travel) that takes over 60 minutes.
- Women consider more things than men when choosing how to travel – in particular safety and cost. Convenience, safety, and cost are top factors for youth.
- There is a high willingness among those surveyed to support and participate in initiatives to increase low-emission transport.
- Education and awareness initiatives about electric vehicles (EVs) and low-emission vehicles are seen as providing the best value for promoting change in the short term. More men (nearly half) than women (around ¼) said they were considering purchasing an EV

in the next 12 months, and around 1/3 of youth said they were considering.

- Concerns about the cost and quality of electric vehicles suggest that people need reassurance about the quality of EVs available in Samoa to consider making the investment.
- Financial incentives might be needed to make EVs affordable enough to generate meaningful change.
- Concerns about safety need to be addressed in planning initiatives for all modes of transport. Bike, bus, and walking are seen as the most unsafe modes, with women also reporting carpooling and taxis as unsafe. Youth are likely to feel safer walking than the population as a whole, and hardly any youth feel that riding a motorcycle or scooter is safe.
- People want to take action to reduce emissions and are keen to support initiatives as long as they understand EVs and barriers to use are addressed.

3.5.3 Public Surveys

A population sample of 1,528 citizens (851 female and 677 male) were surveyed using Computer-Assisted Telephone Interviews (CATI) on the topics of environmental benefits and co-benefits of a transition to low-emissions vehicles and infrastructure, and barriers to low-emission mobility in Samoa, during June and July 2024. This section summarises the key findings from these surveys and how they have helped shape this Strategy.

Disaggregation of survey data revealed consistent findings across age, gender, and rural/urban living environments, indicating little

variation in people’s behaviour, attitudes, and perceptions around transport and low-emission options.

The results of the survey are analysed in the *CAP-IT Final CATI Survey Report*, July 2024.

Current travel behaviour

People mostly travel for shopping, to visit family and friends, and for school or study. Only 15 % of trips were for work or business purposes. There is very little variation between age, gender, or urban and rural groups. Without commuter peaks, all-day frequent bus services will be an important component of a low-emission transport system.

Trip lengths are also evenly spread across 5 to 15-minute, 15 to 30-minute, and 30 to 60-minute durations with around 10 % longer than 60 minutes and 8 % being 5 minutes or less.

The two main ways of getting around are walking (86 %) and private car/pickup (74 %). Many of these walking trips are likely either very short or are part of a bus or car trip. Although most people make most trips by walking or car, about 70% reported using the bus “sometimes, often or always”, so there’s a good existing level of bus use that can be built on.

7% of males and 5% of females are regular (often or always) cyclists, with another 10 % of both genders cycling sometimes.

Safety is the biggest consideration in choosing how to travel, followed by speed, then comfort and convenience. Safety campaigns and initiatives will have the most impact across all ages and genders,

de-emphasising “speed” and promoting “travel time reliability.” Comfort and convenience should also be considered in improvements and in how the modes are presented in campaigns.

Perceptions about transport options

52 % of respondents indicated a level of concern about the impact of transport on the environment, including 29 % that were either very or extremely concerned. Females were slightly more concerned (54 %) than males (51 %). Young males are most likely to not be concerned at all (63 %), and rural people are less concerned than urbanites.

Campaigns and communications could focus environmental messages on improved air quality which is seen as the biggest benefit of low emission transport and include messaging about economic benefits which are seen as positive for households and Samoa by over 50 %.

Motorbike/scooter is seen as the least safe mode (90 % said unsafe or very unsafe), followed by biking (68 %), then carpooling (54 %) and bus (48 %). Walking and driving are perceived as safe or very safe at over 90 %. The biggest difference between male and female perceptions of safety was that males are more likely to regard cycling as safe (35 %) than females (28 %). Females also feel less safe using buses (49 %) and taxis (58 %) than males (55 % and 67 % respectively).

Specific safety concerns about bus use were poor driver behaviour (32 %), unsafe bus stops (15 % - but 24% of females aged 18 to 24) and overcrowding (12 %). Safety concerns about walking were a lack

of footpaths (16 %) and a lack of footpath lighting (6 %, but 9 % for females 18-24) and no pedestrian crossings (6 %). 5 % cited risk of sexual harassment / verbal abuse (but 10 % of males 18-24). In regard to cycling, 41% said there was not enough space on the road

Walking is by far the most affordable mode with 99 % agreeing that walking is affordable or very affordable. Ferries and buses are next in the affordability rankings, seen as affordable or very affordable by over 80% of respondents.

Adoption of electric vehicles

61 % reported considering purchasing an EV, 62 % of rural and 56 % of urban dwellers. The most interested group is adult males – the household decision-makers. For those not considering a purchase, the biggest barriers are the purchase price, safety concerns, a lack of infrastructure, and people just not interested because they are happy with what they have and see no need to change.

Of those interested in purchasing an electric vehicle, most are interested in cars, not boats or motorbikes, and as motorbikes/scooters are seen as unsafe and unaffordable, a campaign and policy focus on electric cars, pickups and vans is suggested.

Key barriers to address are cost and safety. Purchase price is a barrier for 47 % rural and 39 % urban people, with a further 7 % citing the cost to operate and maintain an EV. This perception could be addressed with an information campaign that compares the actual costs and savings of EVs with those of petrol vehicles, including vehicle maintenance cost savings associated with EVs.

21 % of rural and 31 % of urban participants say safety concerns are a barrier to considering purchasing an electric vehicle. More research is needed to identify specific safety concerns to be addressed in the campaign. The information campaign will help 11 % of rural and 13 % of urban participants who say not knowing enough about electric vehicles is a barrier.

Financial incentives (37 %), charging stations (27 %), and skilled maintenance people (22 %) are the most popular initiatives to encourage the adoption of EVs. More females thought financial incentives were the most important (43%) than males (31 %).

Support for low emission transport initiatives is high, and slightly higher with rural people (90 % likely or very likely) than urban people (84% likely or very likely). Interest in shared or rental electric vehicles is also high at 55 and 60 % for rural and urban, and this could be an option in a later phase when the basic infrastructure and information barriers to EVs have been reduced.

Increasing use of active and public transport

Active and public transport is defined as walking, biking, bus, and ferry. Most bus journeys involve walking, and ferry trips cannot usually be replaced by another mode, so this section focuses on walking, biking, and buses.

A good baseline level of active and public transport use exists in Samoa with walking already the top transport choice (86 %), 70 % busing regularly, and 6 % biking regularly. Current use statistics can be used in campaigns to normalise modes, helping to increase use by current users and recruit new users.

Addressing the twin barriers of safety and affordability is key to creating or increasing the use of active and public transport, presenting opportunities for campaigns and policy. Respondents see that a combination of infrastructure and service improvements along with awareness campaigns, promotion, and financial incentives and disincentives would encourage the use of active and public transport. Figure 3.3 shows survey findings of what would encourage active and public transport. Apart from “something else”, the most common suggestions were secure bike parking facilities and dedicated bike lanes. Young males particularly suggested dedicated bike lanes (46 %) while women 25-64 particularly thought secure bike parking was important (49 %).

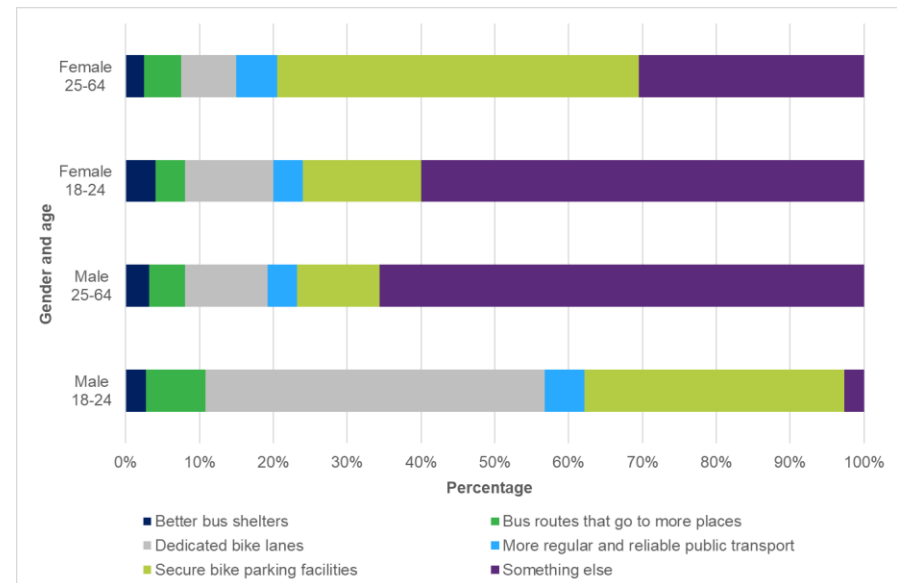


Figure 3.3 Initiatives to encourage active and public transport - age and gender groups

Figure 3.4 shows the “something else” responses to this question grouped by theme. Respondents see that a combination of infrastructure and service improvements along with awareness campaigns, promotion, and financial incentives and disincentives would encourage the use of active and public transport.

Females suggested better and more buses and education campaigns more often than males, who were keener on free or subsidised bus fares.

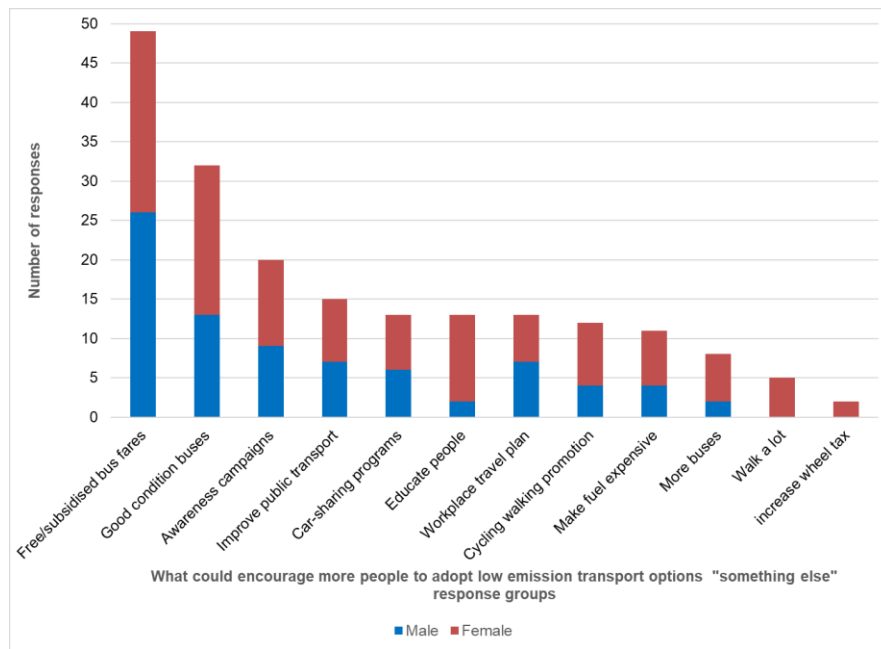


Figure 3.4 Initiatives to encourage active and public transport – “something else” responses

Biking

- Females are 2 % less likely to cycle “often or always” (5 %) than men (7 %). Key barriers are safety concerns about lack of space on the road/safety in traffic, that biking is not safe for passengers, and lack of space or storage to carry shopping/cargo.
- Encouragers are dedicated bike lanes, secure bike parking facilities, and cycling promotion and education including how to lock a bike securely.
- Opportunities are trialling bike lanes on a key route where there is space, identifying off-road bike routes or neighbourhood trails and promoting their use, driver education campaigns, and education for cyclists and potential cyclists to ride safely.

Bus

- Females are 7 % more likely to use a bus “often or always” (41 %) than men (34 %). Key barriers are safety concerns about poor driver behaviour, overcrowding, and unsafe bus stops. Lack of footpaths, difficulty carrying things, some concerns about personal safety on buses due to behaviour of other passengers.
- Encouragers are better bus shelters, routes to more places, free or subsidised bus fares, better buses and more regular and reliable public transport.
- Opportunities are driver training and possible certification to address those behaviours and increase confidence.

Walking

- Females are 4 % more likely to walk “often or always” (89 %) than men (85 %). Key barriers are driver behaviour (traffic safety), behaviour of other pedestrians (personal safety), lack of footpaths, poor lighting, exposure to weather, and having things to carry.
- Encouragers are awareness, education, promotion, and just getting/seeing more people walking.
- Opportunities are working with police to enforce safe driving and address personal safety issues, awareness and education initiatives promoting safer walking routes, and targeted improvements in footpaths, lighting, and bus shelters on key walking and public transport routes. Workplace travel plans may assist in identifying and promoting these routes.
- While not identified in the survey, other stakeholder engagement has identified the prevalence of stray dogs on roads to be a substantial barrier to walking and cycling.



4. Strategic Framework

Figure 4.1 summarises the Strategic Framework adopted. The elements of the framework are discussed in the following sections.

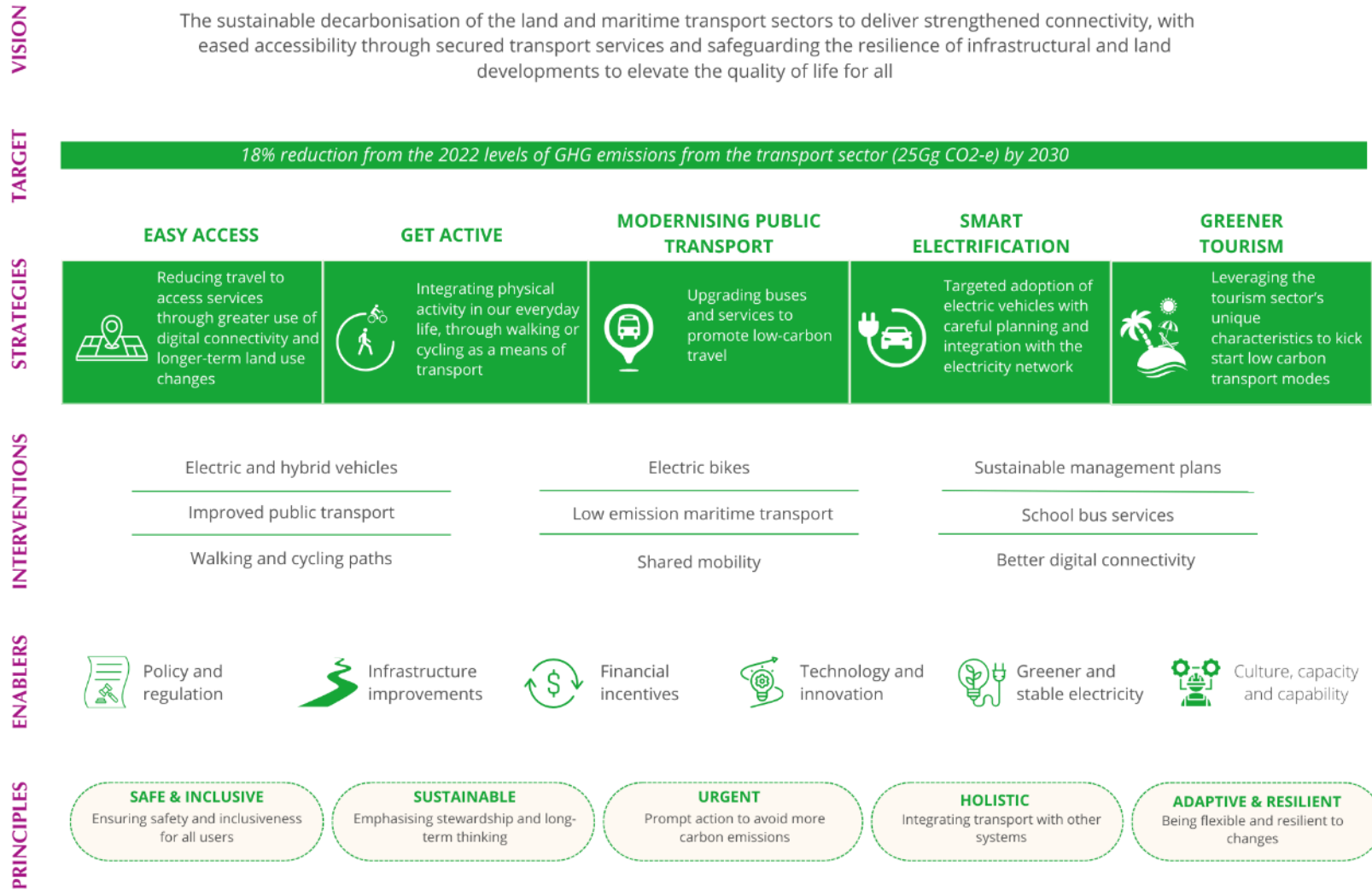


Figure 4.1 Strategic Framework

4.1 Vision

The following Vision for Samoa's transport sector included in the *Transport and Infrastructure Sector Plan 2022/23 to 2027/28* is:

“Strengthened connectivity, with eased accessibility through secured transport services and safeguarding the resilience of infrastructural and land developments to elevate the quality of life for all”

This Strategy has adopted this vision, with the addition of:

“The sustainable decarbonisation of the land and maritime transport sectors”

4.2 Emissions Reduction Targets

Samoa's Second Nationally Determined Contribution (NDC) 2021 states the target reduction from land transport at 5.2 Gg CO₂e by 2030, a 4 % reduction from estimated 2022 emission levels.

The energy sector (which includes land and maritime transport) target of 53 Gg is dominated by the electricity sub-sector contribution of 44.2 Gg CO₂e. This equates to the entire GHG emissions of the electricity sub-sector in 2007.

To achieve the 44.2 Gg CO₂e reduction from the electricity sub-sector, the second NDC states that Samoa aims to generate 100% of electricity from renewable sources by 2025. As the electricity generation sub-sector is now not expected to be 100% renewable by

2025⁹, the target contribution of the electricity sub-sector of 44.2 Gg CO₂e may not be realised.

The electricity demand across Samoa has increased since 2007, and while the share of renewable electricity generation has increased, GHG emissions from the electricity sector increased to 70 Gg CO₂e by 2020, when 43% of electricity generation was from renewable sources (predominately hydro and solar).

Due to the uncertainty that the electricity sector can achieve 100% by 2030, we propose a target based upon electricity being between 60% and 70% renewable by 2030, contributing between 21 and 33 Gg which would mean that the land transport target would be between 16 and 28 Gg CO₂e.

The other target in the 2nd NDC is a 30% reduction in GHG from the energy sector. The GHG emissions from the sector increased from 174 Gg in 2007 to 230 Gg CO₂e in 2020. A 30% reduction from the 2020 level would be 69 Gg. If Electricity achieves 80% renewable by 2030 it would contribute 44 Gg CO₂e, so to get to a 30% reduction from 2020 Transport would have to contribute about 25 Gg.

This Strategy has adopted a 25 Gg target reduction range. This is both ambitious and achievable, given sufficient investment.

The marine transport sub-sector target in the 2nd NDC is a reduction of 3 Gg CO₂e by 2030. This includes the fishing fleet. With the emissions of waterborne navigation in 2020 being about 3.3 Gg CO₂e, and the fishing contributing being about 1.9 Gg CO₂e (total 5.3 Gg

⁹ Based on the updated target in the Samoa Energy Sector Plan of 82% by 2032.

CO₂e), achieving a 3 Gg CO₂e reduction would equate to about a 60% reduction from 2020 levels.

Even with full electrification of the fishing fleet, maritime transport would need to reduce emissions by about 1.1 Gg or 30 %. This might require the replacement of 1 or 2 of the 5 existing vessels with low-emission alternatives, retrofitting solar panels to existing vessels and reducing landside energy use.

4.3 Principles

Through the development of this Strategy, through consultation with key stakeholders, and in response to the results of our public surveys, the principles adopted for the Strategy are:

Safe and Inclusive: People told us they are worried about their safety when using buses, walking, and cycling in Samoa. Recognising the need to seek input from a diverse range of stakeholders in developing the strategy, and subsequent gender-sensitive plans as well as ensuring the final interventions deliver improved equity, safety, accessibility, and inclusiveness.

Sustainable: A sustainable approach encompasses stewardship, long-term thinking, and the need to consider ecological, social, and economic considerations. While delivering positive outcomes the shifts in the transport need to avoid creating detrimental effects.

Urgent: Swift and decisive action is required on emissions reduction to achieve 2030 goals and the quicker we act, the more CO₂e emissions will be avoided.

Holistic: There needs to be consideration of how the different parts of the transport system can work more efficiently together as well as recognising that it must integrate with other systems such as telecommunications, the electricity network, and land development adapted to people's daily transportation routes.

Adaptive and Resilient: Rapid technological changes as well as the impacts of climate change will require a response that is flexible, adaptable, and resilient to events. External forces, such as the potential dumping of ICE vehicles into Samoa by other countries, need to be monitored and managed where required.

4.4 Interventions

The interventions required to reduce the GHG emissions of the transport sector comprise a mix of transitioning to low-emission vehicles, improving the bus service, enabling safer walking and cycling, and introducing shared mobility to both reduce private vehicle trips and increase equitable access opportunities. Alongside these are interventions to improve spatial planning and to improve digital connectivity. These are described further in Chapter 6.

4.5 Enablers

A range of enabling activities are required to deliver or support the interventions. These are summarised here and explained in more detail in Chapters 7 and 8. They include:

- Policy and regulatory changes
- Technology and innovation
- Greener and stable electricity
- Culture, capability and capacity building

- Infrastructure improvements
- Financing and incentives

5. Key strategies

The key strategies are focussed on delivering a more sustainable transport system, including for women, youth, the elderly, persons with disabilities, and rural households in Samoa (Figure 5.1).

The 5 key strategies developed and adopted for the decarbonisation of the transport sector in Samoa are:

1. **Easy access:** reducing travel to access services through greater use of digital connectivity and longer-term land use changes
2. **Get active:** integrating physical activity in our everyday life, through walking or cycling as a means of transport
3. **Modernising Public Transport:** upgrading buses and services to promote low-emission travel with higher safety and quality standards
4. **Smart electrification:** targeted adoption of electric vehicles with careful planning and integration with the electricity network
5. **Green the Tourism experience:** leveraging the unique characteristics of the tourism sector to help kick start low-emission transport modes

The following pages expand on how these strategies can contribute towards a lower emission, safer, and more equitable transport system.

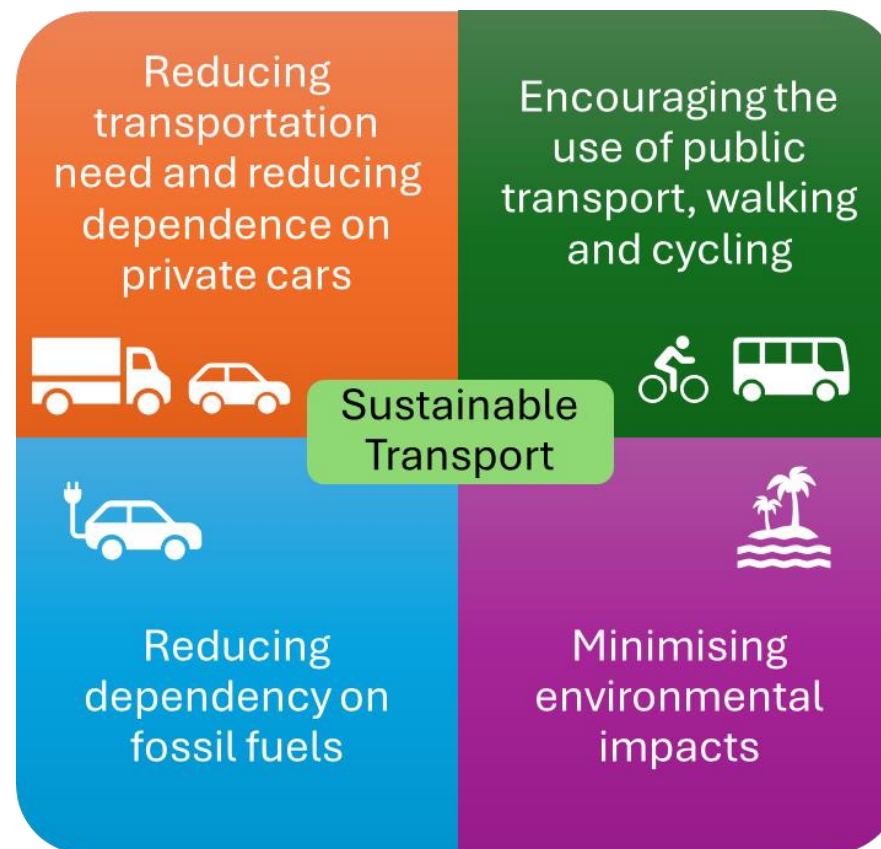


Figure 5.1 Elements of a Sustainable Transport System

Easy access

Transport is a key part of enabling people to access employment, education, shops and services, connect with family and friends, get to and from church and recreation activities, and for the movement of goods and produce. The need to travel, the trip length, and the frequency of needing to travel are all directly influenced by how our towns, villages, and rural areas develop over time.

Modern accessibility planning comprises three components, spatial proximity (where you need to travel), physical mobility (how you can travel), and digital connectivity (alternative to travel). This is known as “Triple Access Planning”¹⁰ and recognises that the three systems, land use, transport, and telecommunications, work together to determine people’s access needs. This is illustrated in Figure 5.2.

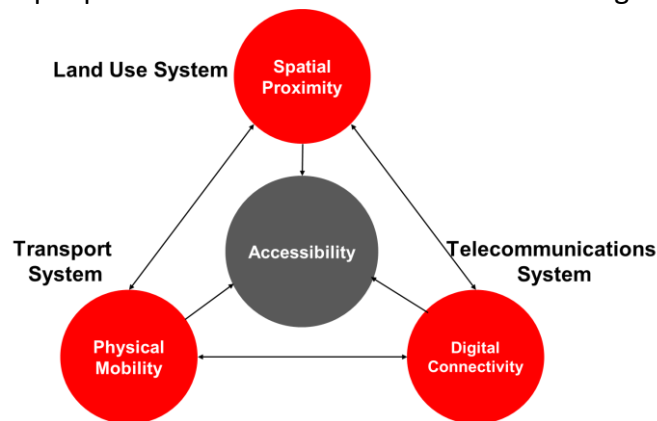


Figure 5.2 Triple Access System

¹⁰ Lyons, G., Marchau, V., Paddeu, D., Rye, T., Adolphson, M., Attia, M., Bozovic, T., Bylund, J., Calvert, T., Chatterjee, K., Comi, A., Cragg, S., Fancello, G., Lenferink, S., Mladenovič, L., Piras, F., Svensson, T. and Witzell, J. (2024). Triple

This Strategy promotes greater consideration of how decisions about Samoa’s land use influence the need to travel. The availability of shops, services, and education within easy access of people’s homes by walking, cycling, or bus would reduce the need for car travel, enabling both lower emissions and healthier, more independent people. For example, locating high trip-generating land uses in areas near a large residential population reduces travel.

Digital connectivity is an important and growing factor in enabling “travel” without leaving home. The ability to shop, bank, pay bills and submit forms, engage with a medical practitioner, or simply communicate with a family member through a computer or mobile device can replace the need for physical travel, thus contributing to a lower emissions transport sector.

This Strategy promotes greater access to online services across a broad spectrum including access to Government services, free widespread internet banking, utility providers, and online shopping.

An important feature of digital connectivity, which rocketed worldwide during COVID-19 restrictions, is the ability to work from home. This Strategy encourages businesses to move towards allowing hybrid working where feasible, which has many benefits including decreased emissions.

Access Planning for Uncertain Futures – A Handbook for Practitioners (Summary version), March. <https://uwerepository.worktribe.com/output/11751967/>

Get active

Regular walking and cycling as a mode of transport is not just good for the environment by reducing air pollution, noise pollution, and greenhouse gases, but also has significant positive health impacts for communities. Integrating physical activity in our everyday life, through walking or cycling for transport, is linked to improved mental health and a reduced risk of cardiovascular diseases and cancer¹¹.

Key constraints to people walking and cycling for transport were identified through the consultation and include having to share the road with vehicles when cycling and a lack of footpath networks to where people want to travel.

Our surveys show that over 85% of Samoans regularly walk, though often likely for short trips or as part of a bus or car trip. People might walk more often and for longer if footpaths were more widespread and well maintained, and they would benefit from increased tree cover to provide shade and shelter. Widespread and quality public lighting where people are likely to walk at night should be prioritised for increased safety and security, especially for women, girls and people with disabilities.

Electric bikes and e-cargo bikes provide an opportunity for those who would not or could not ride a traditional bike to “give it a go”. E-bikes are becoming cheaper and could be shared within villages

enabling more people to have the opportunity to use them. Villages would likely need incentives to purchase e-bikes but should contribute to the cost to instil a sense of ownership. E-bikes also enable people to ride further than they might on a regular bike.

Village e-bike rollout should include skills clinics and e-bike test days to boost the confidence of less experienced riders, both men and women and people with disabilities. Examples of similar programmes have been implemented successfully in local communities in Māngere, Auckland.¹²

Considering the key constraints and factors influencing transport mode choices, investment in street improvements to make walking and cycling safer could make active modes more attractive. Walking and cycling paths should be safe from the traffic through a separate, dedicated space, well designed and integrated into the urban planning to avoid dangerous crossings with cars, and as much as possible protected by the heat and heavy rain by trees.

Implementing targeted improved cycling and walking paths can make active modes more accessible to all by creating a safer and more enjoyable experience. These are likely to be in the Apia area where greater population density and proximity to jobs, education and shops within a walkable or cyclable distance means there is a higher likelihood of transferring car trips to walking and cycling.

¹¹ About Transport and Health, Environmental Health Intelligence New Zealand, accessed 12 August 2024, <https://www.ehinz.ac.nz/indicators/transport/about-transport-and-health/#active-transport-walking-and-cycling>

¹² How Māngere plans to become the cycling capital of the Pacific, accessed 14 August 2024, <https://thespinoff.co.nz/society/25-09-2023/how-mangere-plans-to-become-the-cycling-capital-of-the-pacific>

Modernising Public Transport

Public bus services are an important part of the Samoan transport system providing a moderate-cost choice for travel on both main islands through the services of about 330 buses. Buses move thousands of people every day and the 2021 census revealed that buses remain the main source of mobility for nearly half of all Samoan households.

However, the buses, bus infrastructure, and the services provided have changed little over the past few decades, contributing to high CO₂e emissions, noise, and air pollution and reducing the appeal of using buses for an increasing proportion of people.

The “wooden” buses have poor fuel efficiency and are far from reaching modern expectations for passenger safety, accessibility, or comfort. Replacement with modern low-emission (likely electric) buses would reduce emissions, provide a safer and more comfortable journey for passengers, improve the image of the bus service, and attract new passengers.

The operation of the bus services also reduces the appeal of using buses. Overcrowding, lack of information on routes or timetables, and poor driver behaviour are mentioned as reasons for not using buses. These can be addressed by enforcing existing rules, better information, and driver education.

The safety of school children using buses to get to and from school can be tackled by having trained female bus drivers and by providing dedicated school bus services before and after school. These can use existing buses (preferably purpose-built buses) equipped with a “School” sign and contracted to deliver a dedicated service on a set route. They should be free to use.

In the 2024 UNDP public survey on perceived barriers to lower-carbon transport options, young female respondents reported unsafe bus stops (for example due to a lack of or poor lightning) and overcrowded buses as higher concerns than the other sex and age groups, while female adults reported poor bus driver behaviour as a higher factor. The Apia bus stations need substantial upgrades to provide a safe and efficient experience for buses and passengers including women, girls and people with disabilities. Providing better services, information, and amenities for passengers would improve their waiting experience and further increase patronage.

The frequent stopping of buses is a unique feature of Samoa’s culture and is likely to continue, and it has some security benefits. However, for long journeys between key destinations, an express bus service that only stops at a few set locations would be a desirable addition to travel options. Trialling an express electric bus route, for example Faleolo International Airport to Apia downtown, would demonstrate efficiency while serving a recognised transport demand and potentially reducing car trips and their emissions. Targeted bus or high occupancy priority lanes could reduce delays to buses due to congestion and should be investigated to assess their feasibility where road space permits.

For Maritime Transport, low-carbon technologies should be adopted for inter-island ferries. This could include retrofitting solar power systems as has been installed on the MV Lady Samoa 3, and promoting the use of alternative fuels (e.g., biodiesel). New ferries, such as the planned replacement for Fotu-o-Samoa II should be low-emission, electric or hybrid vessels.

Smart electrification

Shifting to electric modes of land and maritime transport (including hybrid) will deliver immediate emissions savings for Samoa. Electric motors are more energy efficient than diesel and petrol engines, reducing fuel costs (and fuel imports), limiting emissions, and reducing maintenance costs. However, to maximise benefits and reduce potential negative impacts, electrification needs to be meticulously planned. This includes careful integration with the electricity grid; targeted rollout of electric vehicles; use of regulations and standards for EVs and charging equipment; and appropriate management of EV batteries.

Experience from other small island states suggests even a relatively low number of EVs can cause issues for the electricity grid. Samoa will need to consider mitigation strategies to avoid issues such as overloading. Controlling charging will be key and initially, this may be through passive measures (i.e. use of timers) and eventually, if necessary, introducing smart charging as an active control.

The success of electrification is highly dependent on a reliable supply of electricity from renewable sources. This will be achieved through grid-connected renewable projects, improvements to grid stability, and the development of off-grid generation along with battery storage. EVs will increase the overall electricity demand which can drive investments in renewables to support this demand. EVs also have some benefits for renewable generation acting as a flexible load that can make better use of the intermittent supply from renewable generation (i.e. daytime solar).

Learning from other countries Samoa can standardise the rollout of EVs and charging infrastructure to ensure a seamless user experience, create a safer environment, and reduce redundant technologies. This includes determining a standard for EV chargers and ensuring through regulation that EVs with poor battery health or that use redundant technologies are not imported. This can also extend to planning how EVs can provide a backup power supply during outages.

EV batteries represent a valuable resource with significant second-life opportunities for stationary storage and the potential for continuous use of valuable metals. Establishing a predetermined lifecycle for these batteries, maximising their utility, and securing funding for their administration and management will significantly reduce the risk of stockpiling or improper disposal. A collaborative regional approach with other Pacific nations is anticipated to be the most efficient strategy to address this issue effectively.

The Samoa Electric Power Corporation (EPC) conducted an EV Pilot Project to understand how EVs impact the electricity grid and perform in Samoan conditions. The trial provided valuable insights into the feasibility of EV adoption, revealing significant cost savings and reduced greenhouse gas emissions compared to petrol and diesel vehicles. While challenges such as parts sourcing, infrastructure development, and connectivity issues were identified, these are expected to be overcome as EVs become more common. Based on the trial, EPC plans to expand its EV fleet, continue to develop charging infrastructure and advocate for supportive policies to enhance EV adoption and grid capacity.

Green the tourism experience

The tourism sector in Samoa offers a unique opportunity to integrate low-emission travel modes with the natural environment, a key selling point for the destination.

Tourism generates distinct travel patterns compared to local travel, focusing on specific accommodations, attractions, and key destinations like the airport and ports. Tourists typically use the ring roads around both islands mostly travelling independently, visiting various coastal points of interest. They are generally willing to pay more for travel and contribute to funding environmental improvements, making them likely to support low-emission travel options.

The Pacific Tourism Organisation, in its sustainability framework, prioritises the transition to a low-emission sector, and Samoa is making significant strides in this area. The Samoan Tourism Authority has been supporting a programme of energy efficiency, while operators are adopting e-bikes, EVs, and hybrids.

International operators are also well-positioned to invest in the necessary vehicles and infrastructure, fostering the introduction of new services like car sharing and e-buses from the airport, as well as new experiences such as e-bike tours.

As tourists adopt low-emission transport, residents will observe these technologies in action, increasing awareness and understanding of their benefits. This normalisation of different transport modes can facilitate their broader community adoption. For example, an electric van used by a resort for guest transport

might also serve workers, initially sparking interest due to its quietness, lack of emissions, and signage that identifies it as an electric vehicle, eventually becoming a familiar sight.

Tourism-related campaigns, while targeting tourists, also influence local communities by educating them about the environmental and economic advantages of low-emission technologies.

Introducing low-emission options for tourists to reach their destinations and travel around the country while sightseeing caters to the growing segment of environmentally conscious travellers. The eco-tourism market is expanding as more travellers seek to minimise their impact, recognising the significance of their transportation choices. Electric or hybrid ferries between Upolu and Savai'i would provide a better tourism experience.

Alongside sustainable practices like water efficiency, onsite renewable energy use, and support for local villages, tourists are increasingly looking to reduce their carbon footprint during their stay, with transportation choices being a major factor.

As Samoa addresses these needs the country is more likely to attract this segment of the tourism sector.



6. Strategic Interventions

A long list of potential options for reducing GHG emissions and improving the efficiency and equity of the land transport system was developed from stakeholder engagement, international research, and efficiency analysis.

The long list was evaluated against a range of criteria that assessed each option’s ability to deliver on strategy outcomes, the feasibility of achieving change by 2030, and social, environmental, and economic impacts. The evaluation was presented and endorsed at a multi-stakeholder workshop in June 2024.

The STEM has been used to estimate the costs and benefits of low-emission vehicle interventions. Intervention performance on delivering outcomes sought, the assessed capital and operating costs, and the risk level in delivering the 17 shortlisted interventions by 2030 are summarised in Table 6-1.

Capital and operating costs have been estimated using current (2024) typical costs for buying new and used vehicles, and the 2024 costs of diesel, petrol and electricity in Samoa. No allowance for escalation has been applied at this stage. The assumptions used in this analysis are summarised in Appendix A.

The following pages summarise the highest priority strategic land and maritime transport interventions to be taken forward for development through the Sustainable Land Use and Mobility Plan and consideration for inclusion in updates of relevant sector plans and strategies.

Table 6-1 Strategic Interventions

Intervention	GHG Reduction	Co-Benefits	Capital Costs	Operating Savings	Risk Rating
Land Transport Sector					
Electric buses	✓✓✓	✓✓	H	H	H
Electric/hybrid taxis	✓✓✓	✓	H	H	M
Electric/hybrid Govt vehicles	✓✓✓	✓	H	H	L
Electric/hybrid small trucks	✓✓	✓✓	M	M	M
Electric/hybrid rental vehicles	✓	✓	M	M	M
Electric/hybrid private vehicles	✓✓✓	✓	H	H	M-L
New express e-bus routes	✓	✓✓	L	M	M
Electric bikes for villages	✓	✓✓	L	M	M
Electric minibuses for villages	✓✓	✓✓✓	M	M	M
Sustainable Management Plans	✓	✓	L	L	L
Walking and cycling paths	✓	✓✓	L	L	M
Vehicle scrap scheme	✓	✓	L	L	M
Bus station upgrades	✓	✓✓	M	L	M
School bus services	✓	✓✓	L	L	L
Maritime Transport Sector					
Electric/hybrid ferry	✓✓	✓	H	H	M
Solar panels on ferries	✓	✓	L	L	L
Lower carbon ferry Terminals	✓	✓	L	L	L

Replacement of Wooden Buses with Electric



Assumed Scale	30 %-50 % of existing fleet (50-85 new buses)
Estimated Annual CO₂e Savings	3.9-6.5 Gg
Co-benefits	Improved safety, improved access and equity, environmental
Estimated Capital Cost	US \$24 million - \$40 million
Estimated Annual Opex Savings	US \$1.7 million - \$2.9 million
Investment Owners	Private Sector
Possible Regulatory Levers	Restrict new bus registrations to low-emission vehicles
Possible Financial Levers	Import duty concessions, low-interest loans, leasing
Risk Level	High
Implementation Period	2026-2030 (10-17 buses per year)

Replacement of Taxis with Electric/ Hybrid



Assumed Scale	70 %-80 % of the fleet (1,200-1,400 taxis). 15-19% electric, 81-85 % hybrid
Estimated Annual CO₂e Savings	3.9-4.7 Gg
Co-benefits	Improved safety, environmental
Estimated Capital Cost	US \$19 million - \$22 million
Estimated Annual Opex Savings	US \$2.0 million - \$2.4 million
Investment Owners	Private Sector
Possible Regulatory Levers	Restrict new taxi registrations to low-emission vehicles
Possible Financial Levers	Import duty concessions, low-interest loans
Risk Level	Medium
Implementation Period	2025-2030 (200-250 taxis per year)

Replacement of Government Vehicles with Electric/Hybrid



Assumed Scale	65 %-80 % of the fleet (420-560 vehicles) Assumed 50/50 electric/hybrid
Estimated Annual CO₂e Savings	2.9-3.9 Gg
Co-benefits	Safety, environmental
Estimated Capital Cost	US \$21 million - \$28 million
Estimated Annual Opex Savings	US \$0.9 million - \$1.2 million
Investment Owners	GoS
Possible Regulatory Levers	Government vehicle policy
Possible Financial Levers	Import duty concessions
Risk Level	Low
Implementation Period	2024-2030 (60-80 vehicles per year)

Replace Small Trucks with Electric/ Hybrid



Assumed Scale	10 %-15 % of fleet (70-110 vehicles) Assumed 50/50 electric/hybrid
Estimated Annual CO₂e Savings	0.7-1.0 Gg
Co-benefits	Safety, environmental
Estimated Capital Cost	US \$5.6 million - \$8.4 million
Estimated Annual Opex Savings	US \$0.2 million - \$0.3 million
Investment Owners	Fleet owners, Govt depts
Possible Regulatory Levers	Vehicle import standards
Possible Financial Levers	Import duty concessions, low-interest loans
Risk Level	Medium
Implementation Period	2025-2030 (12-18 vehicles per year)

Replace Rentals with Electric/ Hybrid



Assumed Scale	5 %-15 % of fleet (40-120 vehicles) Assumed 50/50 electric/hybrid
Estimated Annual CO₂e Savings	0.1-0.3 Gg
Co-benefits	Safety, environmental, tourism
Estimated Capital Cost	US \$2 million - \$6 million
Estimated Annual Opex Savings	US \$20,000 - \$60,000
Investment Owners	Rental companies
Possible Regulatory Levers	Vehicle import standards
Possible Financial Levers	Import duty concessions, low-interest loans
Risk Level	Medium
Implementation Period	2025-2030 (7-21 vehicles per year)

Replacement of Private Vehicles with Electric



Assumed Scale	5 % of fleet (880 vehicles)
Estimated Annual CO₂e Savings	2.0 Gg
Co-benefits	Improved safety, environmental
Estimated Capital Cost	US \$16.5 million
Estimated Annual Opex Savings	US \$0.7 million
Investment Owners	Private
Possible Regulatory Levers	Vehicle import standards
Possible Financial Levers	Import duty concessions, low-interest loans
Risk Level	Medium
Implementation Period	2025-2030 (150 vehicles per year)

Replacement of Private Vehicles with Hybrid



Assumed Scale	10 %-15 % of the fleet (1,800-2,600 vehicles)
Estimated Annual CO₂e Savings	2.0-2.9 Gg
Co-benefits	Improved safety, environmental
Estimated Capital Cost	US \$26 million - \$40 million
Estimated Annual Opex Savings	US \$1.1 million - \$1.7 million
Investment Owners	Private
Possible Regulatory Levers	Vehicle import standards
Possible Financial Levers	Import duty concessions, low-interest loans
Risk Level	Low
Implementation Period	2025-2030 (300-450 vehicles per year)

New Electric Express Bus Routes



Assumed Scale	1 – 2 Routes (4 new buses per route)
Estimated Annual CO₂e Savings	0.2-0.4 Gg
Co-benefits	Improved safety, access, inclusivity, environmental
Estimated Capital Cost	US \$2 million - \$4 million
Estimated Annual Opex Savings	US \$0.1 million - \$0.2 million
Investment Owners	Private or STA / SIA
Possible Regulatory Levers	Bus operating regulations
Possible Financial Levers	Variation of bus fares
Risk Level	Medium
Implementation Period	Pilot 2026 airport express, second route 2028

Electric Bike Shared Mobility



Assumed Scale	2,000 – 3,000 e-bikes
Estimated Annual CO₂e Savings	0.5-0.8 Gg
Co-benefits	Improved health, equity, access, environmental
Estimated Capital Cost	US \$4 million - \$6 million
Estimated Annual Opex Savings	US \$0.2 million - \$0.4 million
Investment Owners	District / Village Councils/GoS
Possible Regulatory Levers	n/a
Possible Financial Levers	Incentives for purchase and maintenance
Risk Level	Medium
Implementation Period	50 bike Pilot 2025, rollout 2027-2029

Electric Minibus Shared Mobility



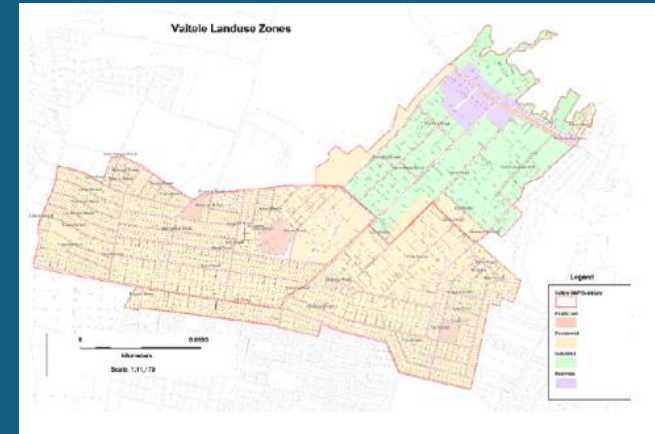
Assumed Scale	80-100 minibuses
Estimated Annual CO₂e Savings	0.4-0.6 Gg
Co-benefits	Improved equity, access, environmental
Estimated Capital Cost	US \$4.2 million - \$5.3 million
Estimated Annual Opex Savings	US \$0.2 - \$0.3 million
Investment Owners	District / Village Councils/GoS
Possible Regulatory Levers	n/a
Possible Financial Levers	Incentives for purchase and maintenance
Risk Level	Medium
Implementation Period	5 bus Pilot 2025, rollout 2027-2029

Dedicated School Bus Services

SCHOOL BUS

Assumed Scale	10 school bus routes operating before and after school using existing buses
Estimated Annual CO₂e Savings	n/a but expected to replace some car trips
Co-benefits	Improved safety, equity, access, environmental benefits, and potentially increased female workforce in the transport sector
Estimated Capital Cost	n/a
Estimated Annual Opex Savings	n/a, operating costs
Investment Owners	LTA / Schools
Possible Regulatory Levers	n/a
Possible Financial Levers	GoS grant to cover operators' costs, free travel for students
Risk Level	Low
Implementation Period	Pilot 2 routes 2025 Roll out 2026/2027

Sustainable Management Plans



Assumed Scale	2-3 SMPs by 2030
Estimated Annual CO₂e Savings	n/a expected to deliver GHG savings beyond 2030
Co-benefits	Improved equity, access, environmental,
Estimated Capital Cost	US \$0.2 million - \$0.3 million
Estimated Annual Opex Savings	n/a
Investment Owners	MNRE / PUMA
Possible Regulatory Levers	n/a
Possible Financial Levers	n/a
Risk Level	Low
Implementation Period	2025-2030

Walking and Cycling Paths



Assumed Scale	10 km by 2030
Estimated Annual CO₂e Savings	0.1 Gg
Co-benefits	Improved health, equity, access, environmental
Estimated Capital Cost	US \$2 million - \$3 million
Estimated Annual Opex Savings	n/a
Investment Owners	LTA / MWTI / MNRE
Possible Regulatory Levers	n/a
Possible Financial Levers	Donor funding for capex and opex
Risk Level	Medium
Implementation Period	2026-2029

Vehicle Scrappage Scheme



Assumed Scale	1.5 - 3 % of oldest vehicles (500-1,000 vehicles)
Estimated Annual CO₂e Savings	N/A – incentive for EV uptake, with GHG reduction covered elsewhere
Co-benefits	Improved safety, health, equity, environmental
Estimated Capital Cost	US \$0.5 million - \$1 million
Estimated Annual Opex Savings	n/a
Investment Owners	MoF
Possible Regulatory Levers	Needs special legislation
Possible Financial Levers	Assumed payment of US \$1,000 per scrapped vehicle. This could be a deposit to purchase a low-emission vehicle (including e-bike).
Risk Level	Medium
Implementation Period	2025-2028

Bus Station Upgrades



Assumed Scale	Savalalo Bus station upgrade by 2029
Estimated Annual CO₂e Savings	0.4 Gg
Co-benefits	Improved safety, health, equity, access, environmental
Estimated Capital Cost	US \$6 million – \$10 million
Estimated Annual Opex Savings	n/a
Investment Owners	MWTI / LTA / MNRE / MoF
Possible Regulatory Levers	n/a
Possible Financial Levers	Donor funding
Risk Level	Medium
Implementation Period	2026-2028

Improved Digital Connectivity



Assumed Scale	All banks and Government Departments offer free and extensive online services
Estimated Annual CO₂e Savings	0.5 Gg
Co-benefits	Improved, equity, access, environmental
Estimated Capital Cost	n/a
Estimated Annual Opex Savings	n/a
Investment Owners	Banks, GoS
Possible Regulatory Levers	Government communications policy, banking regulations
Possible Financial Levers	Discounts for online servicing eg licensing
Risk Level	Low
Implementation Period	2025-2028

Electric Ferry



Assumed Scale	Replace a ferry with a new low-emission electric vessel
Estimated Annual CO₂e Savings	0.8 Gg
Co-benefits	Improved safety, environmental
Estimated Capital Cost	US \$17 million
Estimated Annual Opex Savings	US \$0.3 million
Investment Owners	SSC
Possible Regulatory Levers	n/a
Possible Financial Levers	Import duty concession, low-interest loan, donor funding
Risk Level	High
Implementation Period	2028-2029

Solar Power for ferries



Assumed Scale	Install solar panels on 1-2 vessels
Estimated Annual CO₂e Savings	0.1 – 0.2 Gg
Co-benefits	Environmental
Estimated Capital Cost	US \$0.06 - \$0.12 million
Estimated Annual Opex Savings	US \$0.02 – \$0.04 million
Investment Owners	SSC
Possible Regulatory Levers	n/a
Possible Financial Levers	Import duty concession, low-interest loan
Risk Level	Low
Implementation Period	2026-2030

Lower Carbon Ferry Operations



Assumed Scale	Research and development into lower carbon ferry operations including Mulifanua and Salelologa Ferry Terminals
Estimated Annual CO₂e Savings	Similar projects have yielded about 2 t GHG reduction per year for every US\$1,000 invested ¹³ .
Co-benefits	Improved safety, environmental benefits
Estimated Capital Cost	US \$ 0.3 million
Estimated Annual Opex Savings	Annual operating cost savings are estimated to be about 1/3 of capital expenditure in MTCC study
Investment Owners	SPA / SSC
Possible Regulatory Levers	n/a
Possible Financial Levers	Donor funding
Risk Level	Low
Implementation Period	2026/2027

¹³ <https://gmn.imo.org/wp-content/uploads/2020/10/MTCC-Pacific-Pilot-Project-1-Uptake-of-ship-energy-efficient-technology.pdf>



7. Enabling the Strategy

7.1 Policy and Regulatory Environment

Policies and regulation are crucial enablers for decarbonisation because they provide the necessary framework and guidelines to drive systemic change. They ensure that interventions included in this strategy are not just proposed, but also implemented effectively, creating a structured pathway for achieving emission reduction targets. Without robust policies and regulations, efforts to transition to low-emission technologies and practices can be fragmented and less impactful.

The Government of Samoa (GoS) has developed several plans and strategies to reduce GHG emissions across all sectors, with a significant focus on the transport sector. These plans emphasise the electrification of vehicles and improvements in bus services and low-emission modes like walking and cycling.

The legislation review identified gaps in Samoa's laws and regulations that hinder the large-scale adoption of electric vehicles, electrification of ferries, and better management of bus services.

For instance, while the Nationally Determined Contributions (NDC) plan includes transitioning the government vehicle fleet to electric vehicles, current regulations do not support this implementation. Recommendations from the assessment of Samoa's legislative framework include setting regulations to measure emissions, strengthening enforcement mechanisms, and investing in infrastructure for electric vehicles and charging stations.

Specific examples of legislative and policy changes that could support the transition include:

- Adopting tax relief or other incentives to promote the uptake of electric vehicles.
- Government vehicle purchase policy that promotes electric vehicles for the Government fleet.
- Waste management policy to ensure resource recovery and responsible disposal of batteries from electric vehicles.
- Inclusion of emissions considerations when making decisions on land development applications.
- A clean car standard to incentivise the uptake of low-emission vehicles and discourage higher-emitting vehicles.

7.2 Legislate best practices for fuel efficiency, such as ensuring all passenger/cargo vessels under Samoa Shipping Corporation have developed and implemented Ship Energy Efficiency Management Plans (SEEMP) by June 2025. Fuel consumption data collection by all pax/cargo vessels to become mandatory in December 2024. Establish and enforce regulatory standards for emissions reductions and energy efficiency in the maritime sector.

7.3 Technology and Innovation

In Samoa, technology and innovation will have a role in enabling the transition to low-emission modes of transport while supporting the broader outcomes of this Strategy.

The key technological advancements that are available today and expected to be available up to 2030 include improvements to electric vehicles, the batteries that power them as well as EV charging infrastructure; and the use of smart transportation systems that can provide real-time data on things like bus services and patronage or how cycling and walking infrastructure is being utilised.

Shared mobility will also be enabled by technology. Mobile apps and GPS systems make it easy for users in Samoa to locate, reserve, and unlock shared vehicles. Data analytics optimise vehicle distribution, ensuring cars and e-bikes are available where needed. Secure payment systems and user authentication enhance trust and safety, promoting sustainable transportation and reducing traffic congestion.

Technology will also continue to help to reduce the need for travel in Samoa. Digital communication tools such as video conferencing, remote work platforms, telehealth tools, and virtual collaboration technologies enable people to work, connect, and access services without requiring physical travel.

This shift not only reduces the GHG footprint associated with commuting but also supports a more flexible and resilient workforce. E-commerce will continue to evolve and minimise the necessity for personal travel to stores, further decreasing overall travel demand.

7.4 Greener and stable electricity

Moving to electric vehicles through implementing this Strategy is expected to increase annual electricity demand by 4 % to 6 %, adding between 7,000 and 10,000 MWh per annum on top of the reported 172 GWh generated in 2022¹⁴. While this increase is relatively small, it necessitates a continued rise in renewable energy use to meet this demand and maximise the GHG saving benefits of electric vehicles. This increased demand will also need to be supported by appropriate levels of investment in the grid to ensure resilience.

Some of this demand may be met through distributed generation such as rooftop solar or solar-powered charging stations.

Regulatory changes are already underway to enable residential rooftop solar. If charging is matched to the solar resource, this will provide an effective way to reduce emissions. EV batteries will provide a means to store energy from renewable sources and we can expect to see growth in grid-scale batteries to achieve this on a larger scale as battery prices reduce.

As the grid moves to a higher proportion of intermittent sources for generation (particularly solar) and increasing loads on the network (e.g. high uptake in air conditioning) it becomes difficult to maintain a stable and reliable network. This will be further compounded by challenges to the grid from the impacts of a changing climate. Addressing grid resilience and modernisation through investments in smart grid technologies, advanced grid management systems, and measures to improve grid flexibility and responsiveness will be

¹⁴ Samoa Energy Review Report 2020-2022

crucial to provide confidence for EV operators, and to ensure the necessary uptake in EVs occurs.

The increased uptake of EVs may contribute to challenges for the electricity grid. The cumulative charging of EVs can impact grid performance and stability, potentially leading to isolated overloading of grid components even in the early stages of EV adoption. With proper processes to ensure the Electric Power Corporation (EPC) is aware of planned new electric vehicle (EV) loads early, necessary upgrades to the distribution network can be prepared, largely avoiding network issues.

Case Study: Montgomery Microgrid Charging Depot

Montgomery County, Maryland created a public-private partnership to build a microgrid depot to charge their electric buses. This project will help prepare the site for a minimum of 70 electric buses that will be operated from the facility.

The Bus Depot will be the first of its kind to integrate microgrid controls and solar canopies with electric vehicle charging infrastructure. The microgrid will use energy that originates from solar panels at a bus depot rather than the traditional electricity grid.

The goal is to provide sustainability, reliability, and resilience for the county's transportation system. Electric bus charging, incorporating clean energy production technologies, will enable the County to provide sustainable, resilient, and reliable energy supply for bus charging and site operations.

The project will include the following:

- 2 Megawatts (MW) of solar photovoltaic canopies that will provide electrical power to the buses and to the battery storage systems
- 4.3-Megawatt Hours (MWH) battery storage
- The 5.6 MW microgrid includes distributed energy generation, energy storage and over 2 MW of charging capacity

As the EV market matures, there may need to be changes to the electricity network, such as the introduction of time-of-use (TOU) pricing and smart charging, to steer EV charging to times of day when there is sufficient capacity in the grid. Initially, this may only be possible within the Apia urban area where smart meters are in place.

7.5 Culture, Capability and Capacity Building

7.5.1 Education and Awareness

The Samoan people are key to the success of this transition to low-emission transport. It is crucial that they understand why this shift is occurring, what the benefits will be for them and how they play their part.

The awareness campaign rolling out in parallel to the development of this strategy has helped to educate the general public on the environmental and social benefits of low-emission transport. This will evolve to enable people to try out new technology such as EVs and e-bikes. Further stages will target specific user groups including women, people with disabilities, the elderly, youth and children to ensure they are aware of and realise the benefits of changes to the transport system.

Education and awareness will need to be ongoing throughout the life of the programme to keep people engaged and supportive of the changes that are occurring.

7.5.2 Capability and Capacity Building

The shift to low-emission transport will necessitate new services, infrastructure, and technology. This creates an opportunity to

develop new skills and expand existing businesses (or create new ones) within Samoa to support these. An example could be a female-only taxi station that provides low-emission transportation services during day and night to women, schoolgirls, as well as female tourists.

Shifting to electric vehicles is the most pronounced change, and the CAP-IT project has recognised that and included the development of a suitable upskilling programme, to ensure Samoa has the right training in place to provide the ongoing maintenance for these vehicles. There are other areas where additional capacity might be required, such as for EV charging station installations with existing electricians who are suitably qualified to perform this work. Continued upskilling programmes need to be in the long-term, with incentives to attract a diverse workforce of both women and men.

A key part of the Strategy is to encourage the uptake of e-bikes to replace the need for motorised travel for shorter-distance trips. To overcome fears about riding e-bikes, training on their use and maintenance should be part of the capability enhancement package.

Capacity and capability within the marine transport sector to identify and implement lower emission activities and sustainable practices should be part of the capability enhancement programme. This should include fostering partnerships with international organisations and other countries to share knowledge, technology, and best practices.

The successful enabling, implementation and monitoring of the strategy will require considerable dedicated resourcing from responsible Government departments (such as MWTI, MoF,

and MNRE). The Strategy cost estimate has allowed for additional capacity within Ministries and costs associated with legislative and policy changes, planning, rollout and evaluating pilot studies, feasibility studies, negotiations, programme and project management and monitoring activities including baseline surveys.

7.6 Infrastructure

7.6.1 EV charging

Samoa has made a good start with the initial EV charging infrastructure delivered through the CAP-IT programme. Expanding this to create a network of public chargers that is accessible, of a reasonable speed, and reliable will reduce concerns about range anxiety.

Well-distributed charging stations, especially in high-traffic areas, tourist hot spots, and along the main transport routes will complement at-home and business charging locations. Using direct solar charging will help to reduce emissions and reduce pressure on the grid. In time, smart charging solutions can be integrated that help optimise the use of renewables and support grid stability. Just as for the bus stations, EV charging stations need to consider specific needs of women, children and persons with disabilities.

7.6.2 Transport Infrastructure

Along with upgrades to bus stations and improved walking and cycling facilities, complementary improvements to Samoa's transport infrastructure that can assist the transition have been identified. These include upgrading the traffic signals to a "smart"

adaptive connected system, which can react to changes in traffic flows by changing signal timings and can introduce “green waves” along main routes to reduce congestion and emissions.

Priority lanes allow high-value or more efficient vehicles to bypass traffic queues and decrease travel times. Priority lanes can be designated for specific time periods and are limited to different vehicle classes such as bus-only lanes, bus and high occupancy vehicle lanes, or can include trucks over a certain weight or taxis. Outside of operating hours, lanes can revert to either general traffic lanes or for parking.

There is a lack of published data on the maritime sector, which a feasibility study could overcome to determine the GHG emission levels in maritime transport and understand the viability of low-carbon maritime transport options, including landside ferry terminal operations.



8. Financing the Strategy

8.1 Climate Finance

This strategy requires investment through a diverse financing approach, integrating public funding, blended finance, and public-private partnerships. The Government of Samoa will drive this effort through targeted investments in critical infrastructure and tax-related concessions.

Blended finance will address funding gaps by combining concessional loans and grants from international development partners with private sector capital. Additionally, public-private partnerships will play a crucial role, particularly in developing EV charging infrastructure and shared mobility services, ensuring both sectors contribute to and benefit from the transition to a low-emission transport system.

Mechanism	Description	Key Actions
Public Funding & Concessions	Government-led initiatives to boost the adoption of low-emission land and maritime transport solutions.	<ul style="list-style-type: none"> - Tax Concessions: Reduce import duties on EVs and offer support on licensing fees. - Investment in Infrastructure: Fund EV charging stations and cycling lanes through the Ministry of Finance and MWTI. - Operational Costs: Implement user fees for charging stations and utilise PPPs for maintenance, supported by sustainable revenue streams.

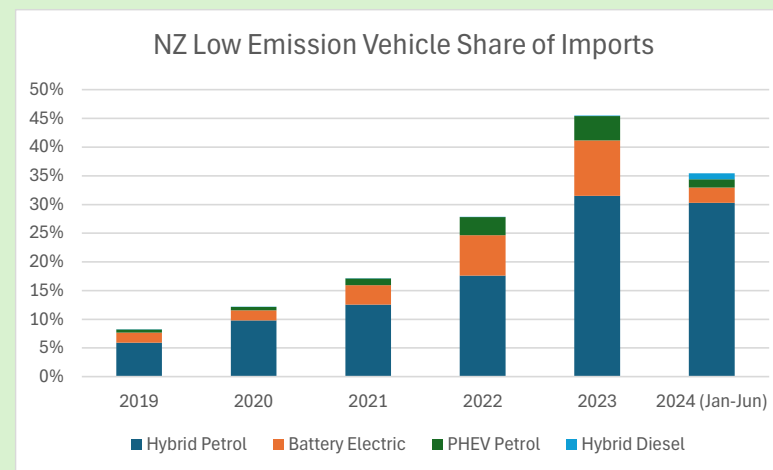
Case Study: NZ Clean Car Discount Scheme

The New Zealand Clean Car Discount (CCD) Scheme was in effect in 2022 and 2023. The scheme was a Governmental initiative to make low emissions vehicles more affordable for New Zealanders and accelerate the decarbonisation of the transport sector.

The discount scheme was based on CO₂ emission values; low emission vehicles registered for the first time in New Zealand (between 1 April 2022 and 31 December 2023) were eligible for a rebate, and high emissions vehicles incurred a fee. The CCD ended on 31 December 2023.

Over the life of the scheme, 192,000 vehicle rebates were paid totalling NZ \$617 million, while 128,000 high emission vehicles were charged a fee totalling NZ \$297 million.

The CCD contributed to a rapid increase in the import of low emission vehicles into New Zealand, which peaked 45 % of all imported vehicles as shown on the chart below. Post CCD the share has reduced but remains much higher than before 2022, dominated by hybrid petrol vehicles.



Blended Finance Approaches	Combining concessional financing from development partners with private capital investment to address funding gaps.	<ul style="list-style-type: none"> - Multilateral Funding: Secure grants and concessional loans from GCF, ADB, and the World Bank. - Private Sector Participation: Attract investment through risk-reduction mechanisms, such as guarantees and concessional financing. - Leasing Arrangements: Electric buses (for example) could be purchased by the GOS (through Donor funding) and leased to operators
Public-Private Partnerships (PPPs)	Collaborations between public and private sectors to drive investment in decarbonisation efforts.	<ul style="list-style-type: none"> - EV Charging Infrastructure: Partner with energy companies to co-invest in EV charging networks. - Shared Mobility Services: Collaborate with tech companies to develop platforms for shared mobility, with the government overseeing regulation and safety standards.

Climate finance can also be used to address gender inequality empowering women either through funded training, provision of goods, or enabling them to create business opportunities that deliver emissions savings.

Case Study – Vanuatu National Green Energy Fund

Established in 2018, the National Green Energy Fund (NGEF) is a national financing vehicle designed to assist the Government to achieve its National Energy Roadmap targets through both public and private investment in technology and infrastructure across Vanuatu.

The NGEF aims to boost households and public institutions’ energy access, while also providing a pathway for local businesses and industries to invest in clean, climate-resilient energy that meets their economic needs, creating transformative opportunities for rural communities. With the NGEF established and functioning, Vanuatu is well positioned to deliver renewable energy access and achieve energy savings across key economic sectors including water, agriculture, fisheries, and tourism.

The NGEF is also helping to channel finance toward clean energy technologies and infrastructure on remote islands. The operations and administration of the Fund are overseen by a Board represented by the Government and civil society and promotes gender inclusion to enable greater participation of women and other vulnerable groups in clean energy development in Vanuatu.

The NGEF has recently provided an interest-free loan to the Vanuatu Ministry of Climate Change to purchase 2 electric SUVs, landed for about US \$70,000. The NGEF is negotiating grant funding to pilot EVs with 10 taxi beneficiaries in Port Vila. This initiative will require beneficiaries to provide 10% equity, receive a 50% grant subsidy, and obtain 40% of the vehicle cost through a soft loan from NGEF at rates below commercial bank rates.

8.2 Investment Required

8.2.1 Capital Investment

The estimated total capital cost of the Strategy ranges from US \$162 million to \$222 million over 6 years between 2025 and 2030 (2024 prices without escalation). The assumptions used in estimating the costs are included in Appendix B.

Most of this investment is in buying low-emission vehicles (a mixture of new and used ones, including an electric ferry) and charging equipment, with US \$8 to \$13 million allocated for infrastructure investment.

The capital cost of low-emission vehicles has reduced considerably over the last decade as technology advancements and production scale have seen these vehicles become more competitive to ICE equivalents. This is expected to continue, which could reduce the capital investment required, however, the conservative assumption adopted is that the cost will remain the same up to 2030.

Considering different investment timescales suggested for elements of the strategy, the forecast cashflow required from 2025 to 2030 can be estimated, as shown on Figure 8.1 for the low and high scenario forecast Strategy capital costs.

The investment estimate has allowed a margin on top of the intervention cost to allow for capacity building, feasibility studies, programme and project management and monitoring and evaluation, totalling between US \$11 million and \$15 million.

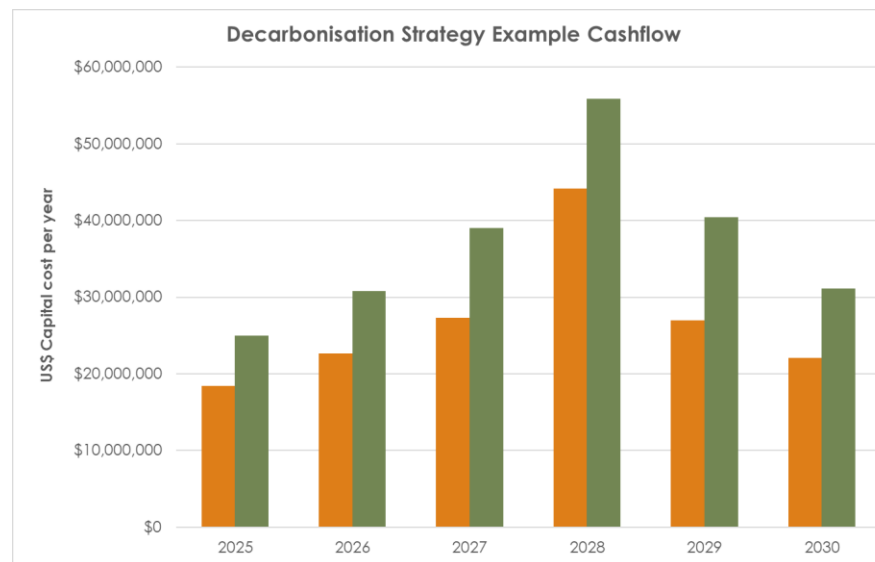


Figure 8.1 Decarbonisation Strategy Example Cashflow

8.2.2 Business as Usual and Incremental Cost

For investment in low-emission vehicles, the capital costs incurred need to be compared to the savings in business-as-usual cost, that is the normal replacement of vehicles with new or used internal combustion engine (ICE) vehicles.

For the number of vehicles targeted in the Strategy, the estimated business-as-usual replacement costs would be between US \$95 million and \$127 million.

The estimated incremental capital cost of implementing the strategy is therefore between US \$67 million and \$95 million.

8.2.3 Operating Costs

Accounting for estimated current fuel use, the proposed uptake of electric and hybrid vehicles, and some transfer of car trips to shared mobility and buses, the STEM estimates the annual operating cost of the land transport sector to reduce by between US \$8 million and \$10 million, at 2024 fuel and electricity prices.

The estimate of the reduction in fossil fuel use, and therefore GHG emissions reduction and operating cost savings, is likely to be conservative, as STEM calculations are based on the average annual kilometres driven within each fleet. The uptake of low-emission vehicles is expected to be highest for owners with higher than average yearly mileage as they will see higher savings. The actual range of kilometres driven will be required to improve these forecasts.

Also, this analysis has not included savings on vehicle maintenance costs. These potential savings will be investigated within the CAP-IT Activity on the Sustainable Land Use and Management Plan.

8.3 Net Economic Benefit

Over 10 years of operation, the STEM estimates the net economic benefit of the Strategy (capital costs less business as usual costs and operating cost savings) to be about US \$10 million. The strategy will also deliver substantial unquantified benefits to equitable accessibility, safety, the environment, and public health.

Figures 8.2 and 8.3 illustrate the strategy financial assessment for the low and high investment scenarios, respectively.

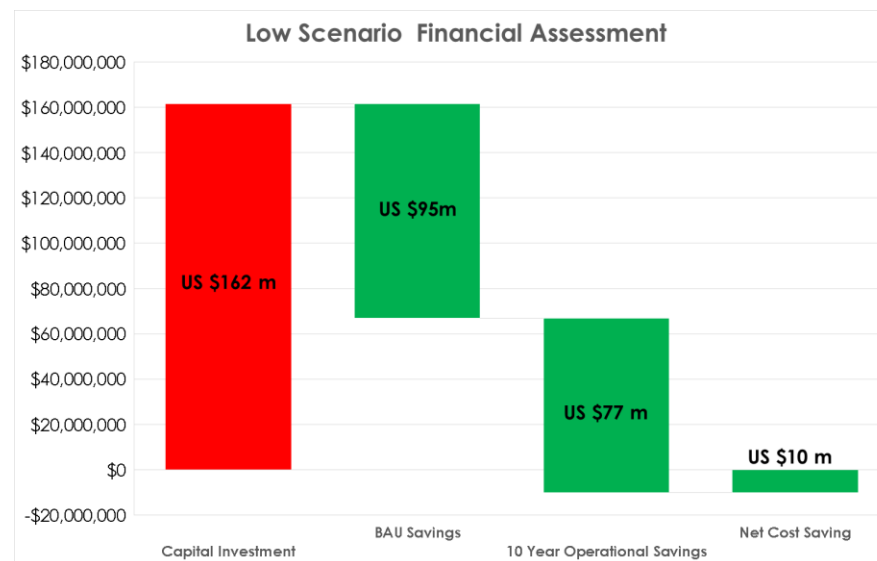


Figure 8.2 Decarbonisation Strategy Financial Assessment - Low Scenario

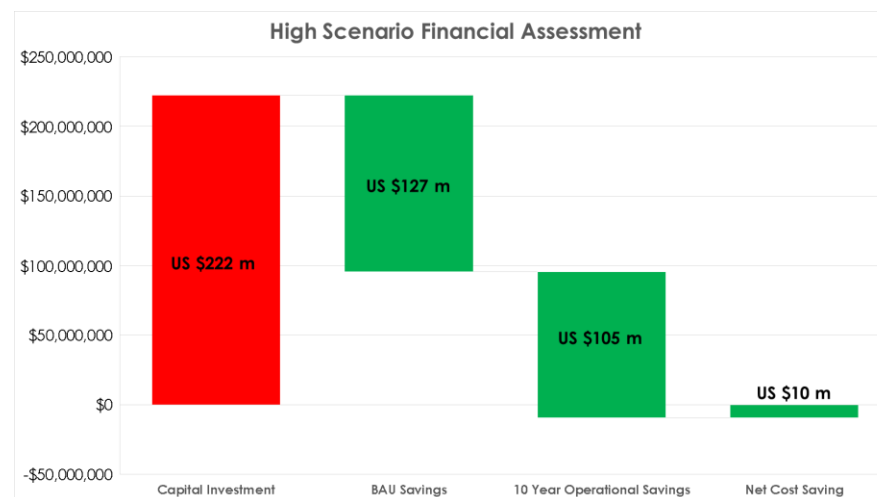


Figure 8.3 Decarbonisation Strategy Financial Assessment - High Scenario

8.3.1 Sensitivity Analysis

Cost Estimates

Three sensitivity tests have been undertaken using the STEM to assess the effects of some likely changes to underlying cost estimates as follows:

1. Increase in fossil fuel pump price of 20%
2. Decrease in capital costs of low-emission vehicles by 10%
3. Both of the above.

Table 8.1 summarises the effect on capital and net costs for the 2 scenarios. In all tests, the 10-year net benefit improves, up to a maximum of US \$55 million in Test 3.

Table 8.1 Cost Sensitivity Test Results

	Low Scenario	High Scenario
Baseline Net Cost 10 yr	-\$10 million	-\$10 million
Baseline Capital Cost	\$161 million	\$222 million
Test 1: Increase in fossil fuel price of 20%		
Test 1 Net Cost 10 yr	-\$29 million	-\$36 million
Test 1 Capital Cost	no change	no change
Test 2: Decrease in low-emission vehicle purchase price of 10%		
Test 2 Net Cost 10 yr	-\$24 million	-\$29 million
Test 2 Capital Cost	\$147 million	\$203 million
Test 3: Both Test 1 and 2		
Test 3 Net Cost 10 yr	-\$43 million	-\$55 million
Test 3 Capital Cost	\$147 million	\$203 million

Renewable Electricity

There remains uncertainty about the ability to deliver a substantial increase in renewable electricity generation by 2030.

The base assumption is that 80% of electricity generation will be from renewables by 2030, but to assess the effects on the forecast GHG reduction we have tested two alternative scenarios

1. 50% renewable electricity by 2030
2. 100% renewable electricity by 2030

Table 8.2 summarises the effect of these two scenarios on the CO₂e reduction forecasts. In each case, the change in forecast GHG reduction is less than 12%. This illustrates that the Strategy will deliver substantial GHG reduction, even if there is only a small increase in renewable electricity generation by 2030.

Table 8.2 Renewable Electricity Sensitivity Test Results

	Low Scenario	High Scenario
Baseline Estimates (80% renewable electricity)		
Baseline GHG Reduction	18 Gg CO ₂ e	25 Gg CO ₂ e
Baseline % Reduction	13 %	18 %
Test 5: 50% Renewable Electricity		
Test 5 GHG Reduction	16 Gg CO ₂ e	22 Gg CO ₂ e
Test 5 % Reduction	12 %	16 %
Test 6: 100% Renewable Electricity		
Test 6 GHG Reduction	19 Gg CO ₂ e	27 Gg CO ₂ e
Test 6 % Reduction	14 %	20 %

9. Implementation Programme

Figure 9.1 shows the proposed high-level implementation programme, which will be developed further for each activity within the Sustainable Land Use and Mobility Plan.

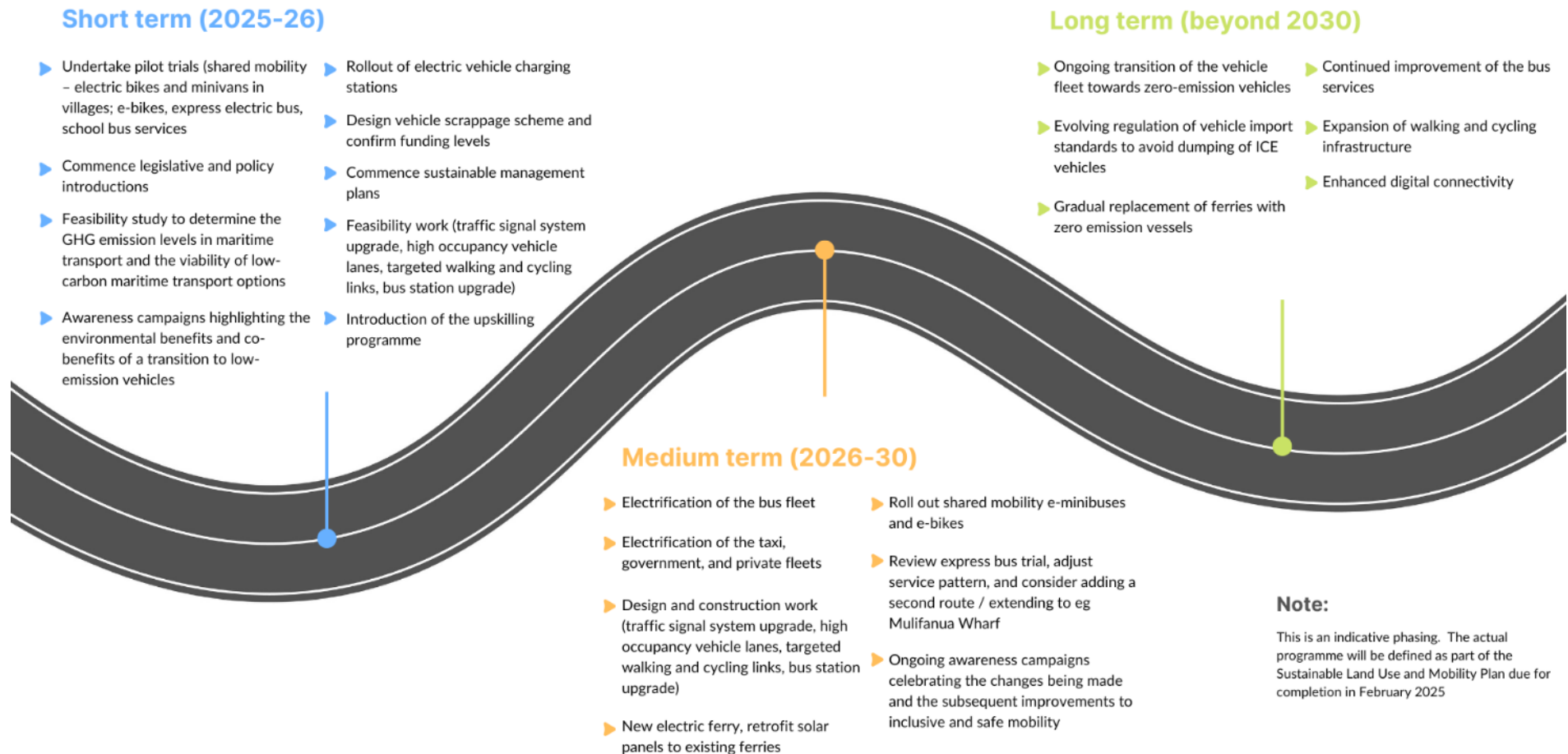


Figure 9.1 Implementation Roadmap

10. Controls

10.1 Monitoring, Reporting, and Evaluation

Monitoring the progress and outcomes of the Strategy will be essential throughout the implementation period. Annual reporting against the project's key performance indicators (KPI) should be undertaken. The proposed KPI for the Strategy are shown on Table 10.1.

Table 10.1 Key Performance Indicators

KPI	Baseline	2030 Target	Source
Fuel consumed by the land transport sector per year	2022 38 million litres petrol, 20 million litres diesel	18 % reduction	PPS data
Electric buses in the fleet	2024 0	50	LTA registrations
Wooden buses in the fleet	2023 170	< 120	LTA registrations
Government vehicles that are low-emission	2024 86	500	Govt Fleet

In addition to the KPIs, several secondary indicators will be used to monitor the effectiveness of this strategy and the ensuing plan. Relevant indicators from the TISP are also included, particularly those relating to land transport. The secondary indicators are:

- Number of electric vehicles procured, disaggregated by type/ service (from TISP)

- Annual total emissions (tCO₂e) avoided from the land transport sub-sector (from TISP)
- Number of solar-charging stations installed, disaggregated by location (from TISP)
- Number of plans developed that promote inclusive and accessible low-carbon mobility (from TISP)
- Number of new policies or amendments to existing policies aimed at reducing transport emissions
- Number of pilot projects testing new technologies implemented
- Kilometres of new walking and cycling paths
- Public satisfaction with bus safety, disaggregated by sex, age and disability
- Annual bus boardings
- Number of males and females often riding bicycles
- Number of female bus and taxi drivers
- Number of old vehicles scrapped

The development of the Decarbonisation Strategy for the transport sector has included taking opportunities to integrate Environmental and Social Safeguards (ESS) and gender aspects. Integration of ESS in the strategy has involved considering the holistic effects of the long list of options to avoid, mitigate, and minimise adverse environmental and social impacts as well as adhering to relevant national legislation requirements (e.g. PUM-Act, National Building Code, SFESA).

This has included the rejection of the option to introduce electric motorbikes due to safety concerns raised in stakeholder

consultation. In addition, the need to plan for the whole of lifecycle treatment of batteries was identified and addressed in the UNDP report produced under Activity 2.2. These environmental and social impacts were included in the multi-criteria assessment of options.

Overall Governance of the Strategy will sit with the Transport and Infrastructure Sector Advisory Committee (TISAC). The Land Transport Subsector Working Group will be responsible for monitoring the performance of the strategy and reporting up to TISAC.

The Strategy should be reviewed annually for delivery against the programme and performance against the key and secondary indicators. A report should be produced summarising the annual monitoring and recommending any changes required to ensure delivery by 2030. Funding for the ongoing monitoring should be agreed between the CAP-IT project partners and is included in the 10% management cost allowance.

10.2 Risk Management and Mitigation

The implementation risks associated with the interventions have been identified throughout the development of the Strategy from inception, mitigations have been applied and the Strategy has been developed as detailed on Table 10.2.

There remain risks to the adoption, delivery, and implementation of the Strategy, which are noted as residual risks in Table 10.2



Table 10.2: Decarbonisation Strategy Risks and Mitigations

Risk	Initial Risk Rating	Initial Mitigation	Current risk rating	Ongoing Mitigation
Insufficient funding is secured to implement the Strategy within the required timeframe	Very High	The Strategy has explored funding options used elsewhere to facilitate green transport transition and considered taxation, duties, and incentives.	High	Expected that donor funding will be required. There are options to engage with countries seeking carbon credits. Explore leasing and shared mobility options to reduce upfront costs.
Bus owners resist replacing wooden buses with electric ones	Very High	The Strategy has evaluated the multiple benefits of transitioning to electric buses, including lower operating and maintenance costs and increased safety	High	MWTI will need to work with bus owners and MoF to develop a pathway to enable the transition to electric buses acceptable to owners
The project fails to gain the political support from key parts of the Samoan Government	High	Strategies proposed were reviewed to ensure alignment with the Land Transport and Infrastructure Plan. Continual stakeholder engagement has occurred. MWTI has been the key lead on the project.	Medium	The Decarbonisation Strategy should be elevated to the appropriate Ministers for their review
Underestimation of Costs leads to cost increases	High	Costs of purchasing LEVs have been sourced from NZ and elsewhere, with a 25% markup added for transport to Samoa. Other infrastructure costs are necessarily very high level	Medium	EV and charging infrastructure costs should be reviewed annually, there is a trend of decreasing costs as production is increased. Infrastructure costs should be reassessed in early feasibility studies
Delays to Implementation lead to underperformance in GHG emissions reduction.	High	Consideration of required lead in times, identification of pilot projects, early scheduling of enabling activities	Medium	Political and technical leadership will be required to ensure adequate capacity is directed to implementing the enabling activities, pilot projects and feasibility studies

Risk	Initial Risk Rating	Initial Mitigation	Current risk rating	Ongoing Mitigation
Failure to deliver a substantial increase in renewable electricity by 2030	High	The strategy has not assumed 100% renewable electricity by 2030 and has used 80% instead. Sensitivity test shows that the Strategy will be very effective even if there is no substantial increase in renewable electricity generation	Medium	Continued focus on increasing renewable electricity generation capability to meet NDC commitments.
Failure to consider gender aspects sufficiently. Risk of pushback on key gender-responsive initiatives	High	A gender expert was embedded in the project team and has reviewed the Strategy with a focus on ensuring gender equity outcomes	Medium	Ongoing engagement with MWCSO to ensure that the Strategy responds to any emerging gender issues. Examples include a training programme for women bus drivers, setting up an EV discount model with subsidies tailored to lower-income/single-parent households, and upgrading the safety and accessibility of bus stations.
There is pushback to implement an upskilling programme to train women to become bus drivers, taxi drivers and EV mechanics due to gender social norms and competition with the existing market.	High	A gender expert was embedded in the project team to formulate these recommendations.	Medium	Ongoing engagement with MWCSO to ensure that the Strategy responds to any emerging gender issues
The Government of Samoa doesn't prioritise implementing subsidies for citizens to convert to lower-carbon transport modes (EVs, e-bikes).	High	A gender expert was embedded in the project team to formulate these recommendations.	Medium	More discussions need to take place with MoF, MWTI and MWCSO to provide evidence-based arguments to support the idea.

Risk	Initial Risk Rating	Initial Mitigation	Current risk rating	Ongoing Mitigation
The engagement process may exclude stakeholders or fail to capture the appropriate level of input.	High	The team has taken multiple opportunities to engage with stakeholders both in one-to-one meetings and in workshops. Public surveys have been completed and the results used to shape the Strategy to reduce risk.	Low	The Strategy should be widely circulated for review by appropriate Ministries and Authorities.
Strategy fails to align with other government policies and plans.	High	Early engagement with stakeholders and a review of key policies and plans has been undertaken. Alignment with Samoa's 2 nd NDC has been discussed with MNRE	Low	GoS policy and plan reviews should respond to and reflect the agreed Decarbonisation Strategy
Outdated technology is specified or ordered	Medium	LEV and charging infrastructure standards are recommended, with pre-import checks on used vehicles to prevent Samoa from becoming a dumping ground for outdated technology	Low	Ensure that vehicles and charging equipment ordered or specified are suitable to deliver the benefits sought and will have sufficient longevity.
The assumptions made for this project may prove to be incorrect resulting in an incorrect strategic direction	High	Exploration and engagement with stakeholders has helped to test assumptions. There remains some risk, but we consider that strategic direction remains sound. Odometer readings have helped calibrate the STEM for the final Strategy report.	Low	Ongoing data collection

11. What's Next?

The Decarbonisation Strategy for Samoa's Transport Sector until 2030 is a first step towards developing a 5-year Sustainable Land Use and Mobility Plan (the Plan).

The Plan will take the recommendations of this Strategy and expand upon the pathway to deliver them to produce a gender-responsive 5-year plan of action to promote low-emission, inclusive and accessible infrastructure and mobility in Samoa. The Plan will:

- Build upon this Strategy and all other CAP-IT Activities.
 - Be country-specific and gender-responsive, with due consideration of the differences in travel behaviour and needs by gender, age and disability in Samoa.
 - Be developed through multi-party stakeholder consultation, making sure to capture the perceptions and needs of women, youth, the elderly and persons with disabilities.
 - Propose how and when sub-sector reduction targets could be implemented to deliver Samoa's National Determined Contributions (NDC) target for the transport sector, considering financial, infrastructure and capability constraints.
 - Support and align with the Samoa Transport and Infrastructure Sector Plan 2023-2028
 - Identify Pilot trials across land and maritime sub-sectors
- Set out the basis and requirements for a monitoring framework.
 - Provide a roadmap to implementation of the agreed prioritised interventions, which will consider the steps required for implementation, any legislative or policy changes required, financial implications and potential external funding sources. This will include:
 - Capacity Building: Identify the pathway to provide training and capacity-building programs for planners, engineers, and decision-makers to ensure they understand the importance of low-emission transition and are equipped with the tools to implement it effectively. Determine the ownership of this pathway.
 - Collaboration and Partnerships: Establish the plan to work with NGOs, women's organisations, youth organisations, disability advocacy organisations, remote villages with specific transport needs and other stakeholders to co-create and implement the plan. These partnerships will help ensure a holistic approach to gender-responsive and socially inclusive planning.
 - Policy Integration: Ensure that the Sustainable Land Use and Mobility Plan aligns with existing policies and strategies related to gender equality, sustainable development, and urban planning.

- Monitoring and Evaluation: The roadmap will include a framework for monitoring and evaluating progress. We will establish indicators to monitor the plan's effectiveness in achieving low-emission transport outcomes, along with gender equality and accessibility. This will regularly assess progress and collect feedback from diverse stakeholders to make necessary adjustments.

The Plan will be submitted in draft for review by the end of 2024, with a final Plan being completed in February 2025.

Appendix A: List Of Stakeholders Consulted

Strategy Intervention Long List Evaluation Workshop

A long list evaluation workshop was held on 19 June 2024. 40 stakeholders were registered in attendance as follows:

NAME	ORGANISATION
Sarafina Lesa	Electric Power Corporation (EPC)
James Mauai	Fire & Emergency Services Authority (FESA)
Faaetete Lene	Land Transport Authority (LTA)
Rodney Lui Yuen	Ministry of Customs & Revenue (MCR)
Lae Siliva	Ministry of Finance (MOF)
Punitia Faaiuasoo	MOF
Moemai Funefeai Tupufia	MOF
Danielle Leo	MOF
Cerella Lei Sam	MOF
Selby Finau	MOF
Toiata Uili	Ministry of Natural Resources & Environment (MNRE)
Elisapeta R. Areta	MNRE
Moana Leiataua-Fruean	Ministry of Public Enterprises (MPE)
Alan Aiolutepotea	Ministry of Women, Community, & Social Development (MWCSD)
Andrea Semisi	Ministry of Works, Transport, & Infrastructure (MWTI)
Matty Aperaamo	MWTI
Wendy Pogi	MWTI
Lagi Faanati	MWTI
Faatauvaava Tavita	MWTI
Alexander Meafou	MWTI
Roini Tovia-Tasesa	MWTI
Ruby Folau-Ah Kuoi	MWTI
Della Savaiinaea Siomia	MWTI

Makerita Atonio	MWTI
Ioane Efeso	MWTI
Vaelupemau Jr. Uatisone	MWTI
Lefau Arthur Pupualii	National University of Samoa (NUS)
Tupuivao Vaiaso	NUS
Iuogafa Soialo	Office of the Ombudsman
Jacob Nansen	PPC
Rilanya Aoina	Public Service Commission (PSC)
Tauaiupolu Palale	PSC
Norris Mitchell	Samoa Audit Office (SAO)
Moe Lene	Samoa Ports Authority (SPA)
Tupai Peter Peilua	Samoa Qualifications Authority (SQA)
Suafoa Meredith	Samoa Shipping Services (SSS)
Annie Tuisuga	Scientific Research Organisation of Samoa (SROS)
Kordzo Sedegah	UNDP
Ropati Vaeau	
Vitilevu Semisi	

Strategy Validation Workshop 1

A Strategy validation workshop was held on 20 November 2024. 38 people were registered in attendance as follows:

NAME	ORGANISATION
Iopu Silipa	Don Bosco Technical Center
Phil Harrison	Flow
Karl Check	Foreseeable
Julie Boucher	Just Add Lime
Nadia Meredith Hunt	KVA
Grace Tualaualelei	KVA
Lynneca Pereira	KVA
Maria Petelo	KVA
Titi Tutuvanu	KVA
Muliufi Nickel	KVA
Selau Asiata	Laumua o Punaoo
Leilani Matavao	MOF
Tagi Talaepa	MWTI
Jenifer Lulu	MWTI
Poini Tovia Tasese	MWTI
Makerita Atonio Iese	MWTI
Faauliuli Pele	MWTI
Andrea Semisi	MWTI
Christina Wanganui	MWTI
Mose Tasesa	MWTI
Fui Simanu	MWTI
Jean Charles Vigo	MWTI
Faith Manuleleua	NUS
Oliveira Simati	NUS

Ierome Tupuola	NUS
Mui	NUS
Teotolite Elisaia	NUS
Tupai Peter Peilua	SQA
Suafoa Meredith	SSS
Roland Setu	STA
Jade Eli Sanerivi	STA
Tina Jane Saunoa	SWA
Kordzo Sedegah	UNDP
Irina Lazzerini	UNDP
Innocent Kabagambe	UNDP
Alioua Niculita	UNDP
Vladimir Kalinski	UNDP
Samuil Shiderov	UNDP

Individual Meetings

Additional meetings were held with the following Ministries, Authorities and organisations throughout 2024 to discuss elements of the Strategy of specific relevance as follows:

Date (all 2024)	Organisation	Main Discussion Points
21 February	LTA	Data Requirements, Driver Licensing, Capability, Road Rules, Enforcement
22 February	EPC	EV Trial results, Renewable electricity, Grid stability
23 February	MoF	Fuel Import Data, Energy Sector Review, Government Vehicle Policy
24 February	UNDP ITM	Data analysis, charging station proposals
28 February	SQA	Upskilling
29 February	MNRE	NDC targets
11 March	MWCSD	Community Engagement, Employment, Equity
14 March	SROS	Battery Research, Firefighting, Biodiesel project
2 April	MWCSD	Public Engagement
3 April	SBS	MICS Plus Survey, CATI Survey
14 May	MWCSD	Public Engagement
9 July	MWTI, MNRE	CO ₂ e Reduction Targets for the transport sector
1 August	LTA	Data collection, emission measurement
1 August	MNRE	CO ₂ e emissions, 3rd NDC, STEM methodology
2 August	EPC	EV Trial, Renewable electricity
2 August	MWTI / PUMA	Planning controls, Sustainable Management Plans
2 August	MoF	Incentives, Financing, Tariffs
20 August	STA	Tourist transport, Green Tourism project

Appendix B: Samoa Transport Emissions Model Assumptions

1. Size of Fleets

Source: LTA Vehicle inspections records, with all duplicate VIN records removed to exclude vehicles inspected more than once per year File "vehicle inspections 2023.xlsx"

Vehicle Type	Diesel Engine	Petrol Engine	Total
Wooden Buses	170	0	170
Purpose Built Buses	148	7	155
Trucks Under 4T	470	270	740
Trucks 4-8T	470	85	555
Trucks Over 8T	211	4	215
Rental Cars	85	736	821
Rental Vans	26	29	55
Government Cars	1	60	61
Government Pickups	381	34	415
Government Vans	203	24	227
Taxi - Car	3	1731	1734
Taxi - Van	39	21	60
Private Cars	1161	17580	18741
Private Minivans	16	3420	3436
Private Vans	615	791	1406
"Other"	188	2	190
Total	4187	24794	28981

2. Fuel Efficiency

Source: International Research, manufacturers and real-world testing, consideration of local driving conditions. Fleet age and engine size, expected maintenance levels

Vehicle Type	Diesel Engine			Petrol Engine		
	Average Year	Average CC	Av km/l	Average Year	Average CC	Av km/l
Wooden Buses	1999	6000	1.5	n/a	n/a	n/a
Purpose Built Buses	2012	4400	2.0	2012	4400	2.0
Trucks Under 4T	2007	3520	4.0	2007	2740	4.0
Trucks 4-8T	2008	5230	3.0	2008	4550	3.0
Trucks Over 8T	2006	7770	2.0	2008	7875	2.0
Rental Cars	2017	2700	10.0	2011	1920	10.0
Rental Vans	2016	2570	8.0	2011	2570	8.0
Government Cars	2015	2950	8.0	2015	2480	10.0
Government Pickups	2015	2780	7.0	2014	3240	8.0
Government Vans	2016	2570	7.0	2015	2760	8.0
Taxi - Car	2012	2500	9.0	2012	1560	8.0
Taxi - Van	2012	2550	7.0	2011	2420	7.0
Private Cars	2011	2850	11.0	2008	1900	9.0
Private Minivans	2011	2300	10.0	2008	2030	8.0
Private Vans	2010	2575	9.0	2006	2340	7.0
"Other"	2002	4900	3.0	2002	4900	3.0
MV Foto o Samoa II	1998	n/a	0.05			

3. Annual Km driven

Source: LTA Odometer readings, International Research, consideration of local driving conditions and usage

Vehicle Type	Assumed Annual Km driven
Buses	45,000
Trucks Under 4T	22,000
Trucks 4-8T	19,250
Trucks Over 8T	16,500
Rental Cars	14,560
Rental Vans	10,400
Government Vehicles	30,000
Taxis	23,400
Private Vehicles	10,920
"Other"	6,000
MV Fotu o Samoa II	16,000

4. Energy Costs (2024)

Diesel Cost	Petrol Cost	Electricity cost
\$US/l	\$US/l	US\$/kwh
\$ 1.40	\$ 1.30	\$ 0.23

5. Capital and Operating Costs

Sources: International Research, Energy Sector Plan

Option	Assumption	Current	Option Cost (100%)		BAU cost (replace like with like)	Estimated	increase	Effect (100%)		Elec used per year	Diesel used to make elec
			Vehicle Cost (USD)	Charging Infa Cost	Unit Cost \$US			Fuel savings	Fuel for Electricity		
Replace Wooden Bus Fleet with Electric	Electric 40 seat buses	170	\$ 375,000	\$ 100,000	\$ 200,000	100%	20%	4,794,000	-	3,825,000	306,000
Replace Taxis with Electric	Used 5 year old evs	1734	\$ 18,750	\$ -	\$ 12,500	100%	20%	518,838	5,063,175	8,115,120	649,210
Replace Taxis with Hybrid	Used 5 year old hybrids	1734	\$ 15,000	\$ -	\$ 12,500	40%	0%	52,149	2,025,270	-	-
Replace Govt Vehicles with Electric / Hybrid	New electric / hybrid	703	\$ 45,000	\$ 5,000	\$ 35,000	70%	10%	1,564,815	278,250	4,745,250	189,810
Replace Small Truck Fleet with Electric / Hybrid	Electric 3t truck	740	\$ 65,250	\$ 10,000	\$ 50,000	70%	10%	1,581,580	1,039,500	5,698,000	227,920
Replace Rentals with Electric / Hybrid	New electric / hybrid	821	\$ 46,000	\$ 5,000	\$ 40,000	70%	10%	8,998	750,131	2,390,752	95,630
Replace Private with Electric	Used 5 year old evs	17596	\$ 18,750	\$ -	\$ 12,500	100%	20%	3,056,901	21,330,400	38,429,664	3,074,373
Replace Private with Hybrid	Used 5 year old hybrids	17596	\$ 15,000	\$ -	\$ 12,500	40%	0%	6,989	8,532,160	-	-
New Express e-bus routes (2)	4 new buses per route = 80 fewer c	8	\$ 375,000	\$ 100,000	\$ 12,500	100%	20%	14,241	193,957	180,000	14,400
Electric bikes for villages (5000)	1 electric bicycle = 0.1 fewer cars	5000	\$ 2,000	\$ -	\$ 12,500	100%	20%	43,184	606,115	546,000	43,680
5000 electric motorbikes for villages	1 electric motorcycle = 0.25 car trip	5000	\$ 4,000	\$ -	\$ 12,500	100%	20%	217,159	1,515,288	2,730,000	218,400
Electric minibuses for villages (100)	1 e-van replaces 2 car trips	100	\$ 52,500	\$ -	\$ 12,500	100%	20%	199	242,446	-	-
Replace Savai'i ferry with electric	New electric ferry	1	\$ 16,000,000	\$ 1,000,000	\$ 12,000,000	100%	20%	268,000	-	400,000	32,000

Note Government, Small Truck and rental replacements are assumed to be 50/50 electric/hybrid: e-Bus charging is assumed to be 50% from solar, 80% electricity generated from renewable sources.