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**National Roads and Road Drainage Policy
for the Cook Islands
2017**

Compiled by: Infrastructure Cook Islands
(in collaboration with our partner agencies and key stakeholders)

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Definitions and abbreviations

Key terms used in this document are defined below:

Aronga Mana	"Aronga Mana" means the persons invested with a customary title in accordance with the custom and usage of the island or vaka where the relevant works are in question. Section 66A(4) of the Cook Islands Constitution Act 1964 refers.
Public roads	<p>For the purpose of this policy, public roads are defined as roads proclaimed as such pursuant to Part 23 of the Cook Islands Act 1915</p> <p>For the purpose of this policy, public roads <u>include</u>:</p> <ul style="list-style-type: none">• Access roads to water intakes and other publicly owned infrastructure, which are proclaimed roads pursuant to the Cook Islands Act 1915 despite the fact that the public may not have unlimited access.• any roads temporary identified as emergency roads or routes during a declared State of Emergency, in terms of the Cook Islands Emergency Management Act 2007• other sealed public areas where Government has the direct responsibility for maintenance, i.e.:<ul style="list-style-type: none">○ public parking areas and sealed public areas (e.g. Tereora BCI Stadium, Telecom Sports Arena parking and driveway, Tereora College) etc.○ bus stops,○ institutional parking areas owned by the government except where these are directly managed by another agency (such as the Airport Authority).
Road Reserve	The road reserve is the area between the surveyed boundaries of roads, otherwise known as the road corridor.

Abbreviations used in the document are defined below:

CIG / Government	(the whole of the) Cook Islands Government
CIIC	Cook Islands Investment Corporation
EMCI	Emergency Management Cook Islands
ICI	(The Ministry of) Infrastructure Cook Islands
NSDP	National Sustainable Development Plan 2016-2020
Police	Cook Islands Police
PRIF	Pacific Region Infrastructure Facility
SOE	State Owned Enterprise
TAU	Te Aponga Uira o Tumutevaroaro (usually shortened to Te Aponga Uira)

1 Vision

'A fit-for-purpose road network which is resilient, integrated, cost-effective and facilitates the efficient and safe transport of goods and people connecting communities and contributing to sustainable economic development'

2 Lead agency

This policy was compiled and developed by Infrastructure Cook Islands (ICI) in collaboration with partner agencies and key stakeholders.

ICI will lead the implementation of this policy.

3 Purpose

This policy provides guidance for the planning, design and implementation of road construction, maintenance and improvement programmes and activities within the Cook Islands, including Pa Enua.

This policy addresses the long-standing legislative and policy gaps relating to the management, construction and maintenance of the public road network in the Cook Islands.

This policy is titled the Roads and Road Drainage Policy. Including the words '*Road Drainage*' highlights an important and sometimes overlooked aspect of road construction and maintenance. Without adequate drainage, roads will rapidly deteriorate, therefore ensuring proper drainage and its ongoing maintenance is a key element of a resilient and cost effective asset.

It is also anticipated that this policy will become a component of a suite of policies, including maritime and aviation policies, which together will comprise a comprehensive Transport Policy for the Cook Islands.

4 Scope and timeline

This is a national policy which applies throughout the Cook Islands. This policy only deals with public roads (as defined in this policy).

This policy is intended to have a life of up to 20 years before replacement. There will be an interim review every four years.

5 Links to National Sustainable Development Plan 2016-2020

This section shows the relationship of this policy to the national vision and goals as set out in the NSDP 2016-2020.

National Vision

"To enjoy the highest quality of life consistent with the aspirations of our people, and in harmony with our culture and environment"

NSDP VISION 2020

National Development Goals

This policy aligns with the following goals of the NSDP 2016-2020:

- "2 Expand economic opportunities, improve economic resilience and productive employment to ensure decent work for all"
- "5. Build resilient infrastructure and Information Communication Technology (ICT) to improve our standard of living
- "6. Improve access to affordable, reliable, sustainable modern energy and transport"
- "13. Strengthen resilience to combat the impacts of climate change and natural disaster"
- "16. Promote a peaceful and just society and practice good governance with transparency and accountability"

This policy primarily contributes to NSDP goals 5 and 6 in relation to land transport infrastructure (roads and road drainage). It also contributes to goal 2 by facilitating economic development, including tourism growth; to goal 13 by seeking to mainstream climate change and emergency resilience into road design and construction; and to goal 16 by seeking to clarify and improve governance arrangements focussing on transparency and accountability.

6 Principles

This section of the policy states the guiding principles that need to be taken into account in giving effect to this policy. These principles are:

- 1. Fit-for-purpose**
Ensuring that roads and associated drainage are of an appropriate standard for the intended use and lifespan and provide value for money relating to whole of life costs. This should be a key factor in determining the appropriate design for particular roads and classes of roads.
- 2. Equity**
The interests of all road users including cyclists, pedestrians, those with disabilities, all genders and ages, are taken into account when developing the road network.
- 3. Safety**
Promoting the safety of all road users and those involved in road construction and maintenance through appropriate design and management practices. Particular regard should be given to the safety of vulnerable road users such as cyclists, pedestrians, those with disabilities, children and older people.
- 4. Stewardship and sustainability**
Managing resources, including built infrastructure, efficiently and effectively and in an environmentally sound manner. This also means appropriate asset management, including planning and maintenance. Protection of the environment and the relationship between roads and adjacent land use etc., must be considered.
- 5. Community service**
Serving the community by providing for their economic and social needs.
- 6. Integrated and innovative**
Adopting integrated and innovative solutions and approaches appropriate to Cook Islands context and values..
- 7. Transparency, accountability and fairness**
Ensuring fair, transparent, and accountable processes e.g. seeking to eliminate or minimise any land disputes relating to public roads, between the government and landowners or between

landowners. Also ensuring clear identification and committed ownership of roles and responsibilities.

8. **Resilience**

Planning for the impacts of climate change and providing for emergency situations including natural and man-made disaster events.

7 Roles and responsibilities

This section identifies the roles and responsibilities of ICI, partner agencies and key stakeholders in relation to this policy:

Agency	Role or Responsibility
Infrastructure Cook Islands (ICI)	Responsible for the construction and maintenance of public roads on Rarotonga (including providing for utility infrastructure within the road reserve, in collaboration with the responsible agencies) and for providing technical guidance and material support to the Island Governments in respect to construction and maintenance of roads in Pa Enua. This responsibility also extends to public parking areas and sealed public areas (e.g. Tereora BCI Stadium, BlueSky Sports Arena parking and driveway, Tereora College), bus stops and government owned institutional parking areas except where these are directly managed by another agency (such as the Airport Authority).
Aronga Mana	Have a critical role in giving landowner agreement to easements for roads. As traditional chiefs from respective villages, Aronga Mana preside over title land rights and issues.
Landowner Representatives	Designated by landowners to represent them in land negotiations including giving landowner agreement to an easement for a road.
Island Governments (IGs)	Responsible for the construction and maintenance of roads in Pa Enua.
Cook Islands Investment Corporation (CIIC)	The state owned entity with responsibility for all Crown (government) assets. Note: The Solicitor General has confirmed that the ownership of public roads is vested in the Crown. CIIC was, in 2016, given additional statutory responsibility for coordinating the development of asset management plans.
Cook Islands Tourism Corporation (Cook Islands Tourism)	The state owned entity with responsibility for promoting tourism in the Cook Islands, through the promotion of Kia Orana principles, which are consistent with this policy.
Ministry of Justice (MoJ)	Responsible for the processing of survey land

Agency	Role or Responsibility
	information, road gazetting, land court and other judicial processes, and for imposing penalties for breach of the Transport Act. Note: The islands of Pukapuka, Mitiaro and Mangaia have their own land tenure systems which are used to approve access and/or roads on these three islands rather than through MoJ.
Cook Island Police (Police)	Responsible for promoting and enforcing vehicle safety and safe use of public roads, including vehicle warrants of fitness, and licensing of drivers. Refer to the Transport Act 1966.
Bank of the Cook Islands (BCI)	Responsible for collecting annual vehicle licensing fees on behalf of the Police who in turn receive it on behalf of the government.
National Environment Service (NES)	One of the functions of NES under the National Environment Act 2003 is to 'protect, conserve, and manage the environment to ensure the sustainable use of natural resources'. Environmental Impact Assessments are required for any activity which causes or is likely to cause significant environmental impacts including new road construction.
Ministry of Transport (MoT)	Responsible for: <ul style="list-style-type: none"> • Standards for vehicle importation • Licensing of motor vehicle retailers.
Ministry of Internal Affairs (INTAFF)	Responsible for: <ul style="list-style-type: none"> • Health and safety in the workplace including road work sites • Managing the road verge cleaning contracts on Rarotonga.
Ministry of Health (MoH)	Responsible for attending to victims involved in motor vehicle accidents and the mobilisation of ambulance services.
Crown Law Office (CLO)	Responsible for the interpretation and review of legislation, under the leadership of the Solicitor General.
Office of the Prime Minister (OPM) - Emergency Management Cook Islands (EMCI)	Responsible for identifying and activating tsunami escape routes and other emergency road routes.
Office of the Prime Minister (OPM) - Climate Change Cook Islands Division	Responsible for promoting identification and planned management of climate change impacts.
Office of the Prime Minister (OPM) - Pa Enua Division	Responsible for oversight of and guidance to the Island Governments.
Road Safety Committee	A multi-stakeholder committee responsible for developing and implementing the Cook Islands

Agency	Role or Responsibility
	<p>National Road Safety Strategy 2016-2020.</p> <p>Core membership:</p> <ul style="list-style-type: none"> • Road Safety Council • Police • Ministry of Health • ICI • Ministry of Education • Community-based emergency rescue / responders • Youth - three college representatives / Youth Counsellor / Council (NGO) • Ministry of Internal Affairs.
Road Safety Council	<p>A non-profit community organisation advocating to reduce serious road crashes on Cook Island roads.</p> <p>Represented on the Road Safety Committee.</p>
Cook Islands National Disability Council	<p>Advocate for new road and footpath designs to cater for people with disabilities.</p>
The Institution of Professional Engineers Cook Islands (IPECI)	<p>Provides a network to support the development of appropriate technical standards including road standards for adoption by the relevant agencies.</p>
South Pacific Engineers Association (SPEA)	<p>Provide support from the South Pacific Region and guidance to IPECI in developing and adopting appropriate technical standards including road standards.</p>
Te Aponga Uira (TAU)	<p>Electricity utility, uses road reserves or corridors for transmission lines.</p>
Bluesky Cook Islands	<p>Telecommunications provider, uses road reserves or corridors for transmission lines.</p>
Te Ipukarea Society	<p>A local Civil Society Organisation with concern for the environment including advocacy for cycle lanes.</p>
Te Mato Vai (TMV)	<p>The project delivery entity charged with delivering the Rarotonga Water Upgrade, in a joint Project Management Unit (PMU) with Mei Te Vai Ki Te Vai Rarotonga, the project delivery entity for waste water and sanitation programmes.</p>

8 Issues and challenges

This section sets out the issues and challenges that have been identified, and need to be addressed in this policy.

8.1 Public perception of the standard of the roads

Public roads on Rarotonga are trafficable, but there is evidence of user dissatisfaction with the condition of the roads. This dissatisfaction has been expressed by stakeholders and is also reported in the media. It includes concerns about the cost and effectiveness of the road repair techniques

currently used on Rarotonga. This criticism has been supported by engineering advice confirming that some techniques are not current best practice.

In the course of the development of this policy, stakeholders stated that the quality of roads on Rarotonga needs to be improved. This is notwithstanding the fact that Rarotonga roads may be in better condition than in some other countries in the Pacific. Appropriate best practices need to be established and adopted including benchmark standards for road maintenance. Also, while road construction is generally to an acceptable standard, contracts related to the development or renewal of roads need to be better coordinated and managed. This would prevent the unnecessary covering of manholes and other utility infrastructure. A coordinated 'dig once' approach with the other utility providers could avoid unnecessary repeated excavation within roads.

Tourist satisfaction surveys conducted by Cook Islands Tourism, on an ongoing basis, have consistently raised the following issues:

- The poor quality of much of the road network
- The disruptive nature of ongoing road works
- The lack of cycle and pedestrian facilities.

These concerns continue to be reflected, despite ongoing concerted efforts by ICI to catch up on the road maintenance backlog. Providing for cycling and walking supports 'slow tourism' which can increase the yield from each tourist visit and therefore improve the return on investment.

The Road Safety Council is concerned about the poor road signage and inadequate pedestrian crossings outside schools. Actions to address this concern are incorporated into the Cook Islands National Road Safety Strategy 2016-2020, led by the National Road Safety Committee.

In Pa Enua, the Island Governments are generally satisfied with the quality of service provided by ICI for roading construction and maintenance, but are concerned about delays in delivery. However users are still concerned about road conditions. In particular sealing is sought to reduce dust levels in village centres and near schools and churches. In the Northern Group, the Island Governments have prioritised maritime navigation aids and port facilities, rather than roading, as they see the sea as their highway.

8.2 Inadequate asset management

The asset management system is not yet a fully functioning integrated system and does not provide up to date asset management plans as a framework for planning and scheduling design, construction and maintenance activities for road assets. A three year phased introduction of the Cook Island Government asset management system was initially planned, with 2015/16 being the second year. Due to inadequate staffing levels, software development and network problems, progress across the whole of the government in using the system as a maintenance planning tool to develop asset management plans has not met expectations. Efforts to effectively implement the system for ICI and Te Mato Vai¹ commenced in late September 2016. Unfortunately implementation in respect to roads was further delayed due to supplier related software issues. In the absence of the proactive approach enabled by asset management plans, maintenance is prioritised in response to complaints rather than through a structured asset management approach.

In a 2015 study of infrastructure budgets in the Cook Islands, the Pacific Region Infrastructure Facility (PRIF)² noted the lack of a transparent planning mechanism to prioritise roads for maintenance and

¹ Te Mato Vai is the entity tasked with managing the upgrade of the Rarotonga water supply

² p64/82, Appendix F, PRIF, 2015

upgrading. PRIF noted that road condition surveys were done on ad hoc basis rather than as inputs into the asset management system and prioritisation was based on complaints and staff institutional knowledge, rather the outputs of the asset management system. The PRIF report comments:

"Currently there are no standards for the quality of roads and no road master plan...There are no documented maintenance procedures, nor planned maintenance for roads. ICI staff commented that they know there will be potholes when there is heavy rain, and they also receive complaints from the public which lets them know where maintenance is needed"

As part of improving asset management, and prioritising work, there is also a need to undertake regular traffic counts and analysis including identifying accident black spots so as to identify priorities for road safety improvements.

8.3 Inadequate expenditure on road maintenance

The 2015 PRIF study identified a number of shortcomings in the funding arrangements for road maintenance, including³:

- Under-expenditure on road maintenance as a percentage of asset value. The expenditure was 1.1% and PRIF recommended that 2-4% of asset value should be set aside annually for required maintenance.
- Consistent under-expenditure on road maintenance against budgeted funds for the three years examined (2011/12; 2012/13; 2013/14).
- Road maintenance being budgeted as capital expenditure rather than operational expenditure.
- Re-allocation of maintenance funds to other priorities. An example given in the PRIF report was the bridges and drainage recurring expenses fund, as follows:

"A review of the expenses charged during 2012/2013 indicates that as well as funding maintenance on bridges and drainage, the fund was used to pay for water maintenance for the year as no budget was made for water recurring maintenance expenses. Even so, the total amount spent for 2012/2013 was only NZD249,000 – well below the total budget of NZD775,000. In 2013/2014 only NZD145,000 was spent out of a total budget of NZD1 million, with a net NZD842,000 from the original budget being reallocated to other priorities during the financial year..."

Although ICI is now consistently spending its maintenance budget, the other shortcomings identified in the PRIF report remain.

8.4 Resourcing of machinery, plant, equipment, labour, expertise and materials

This section describes the role that ICI plays, in conjunction with the private sector and Island Governments, in maintaining roads in the Cook Islands. There is concern as to whether ICI is adequately resourced for some of the roles it currently undertakes. These roles include responsibility for road maintenance on Rarotonga although (as referred to in section 8.7 of this document), it has no formal legal or institutional mandate to do so. Rarotonga road maintenance is currently undertaken by ICI's Civil Works Division using its own internal resources with support from the private sector, which supplies aggregate for use on the roads and provides additional equipment and expertise, as required. Road verge cleaning is undertaken by community based contractors, with the contracts managed by the Ministry of Internal Affairs.

³ p64/82, Appendix F, PRIF, 2015

There is limited specialised road construction equipment available for chip sealing, road line painting, and other specialised work in Rarotonga and more so in Pa Enua. This has reinforced ICI's reliance on its own equipment and raises concerns about difficulties in funding timely replacement. In the past this has affected the ability of ICI to use what maintenance funding is available due to continual breakdown of fatigued equipment, bringing road maintenance operations, including resealing, to a standstill. However, the situation has been alleviated by the purchase of a new bitumen distributor truck and mobile kettle in the 2016-2017 financial year as well as the supply of machinery to Island Governments in 2015.

ICI is responsible for road construction, bridges and drains in Rarotonga. This work is managed by ICI's Planning and Design Division. The Division extensively uses the services of private sector contractors, suppliers, project managers and engineers.

On Rarotonga, ICI's Civil Works Division undertakes both project management and implementation for maintenance. This leads to a perceived lack of transparency and oversight. In Pa Enua, there is a separation between management and delivery as ICI's Planning and Design Division provides project management services and the Civil Works Division acts as contractor.

The Island Governments, particularly those with sealed networks, i.e. Aitutaki, Atiu and Mangaia, depend on equipment supplied by ICI's Civil Works Division, including the bitumen truck and mobile kettle, for road sealing. Road contractors in Rarotonga also rely on this equipment. The absence of a maintenance and replacement policy for roading machinery in Pa Enua and for ICI has led to delays in replacing key machinery such as the bitumen distributor truck and the mobile bitumen kettle.

In 2015, the Island Governments received new machinery increasing the potential for them to undertake more of their own road construction and maintenance works. ICI's Civil Works Division assists in developing the Island Governments workforce to undertake such work. However sealing still requires the shipping of necessary equipment and relevant staff to the islands concerned.

8.5 Role of the private sector in construction and maintenance of roads

Development partners, the private sector and the Ministry of Finance and Economic Management (MFEM) are committed to increasing private sector involvement in road construction and maintenance. The arguments advanced in favour of this include:

- the need for the government to support the private sector in order to sustain economic growth
- demonstrated transparency
- perceived efficiency and productivity gains
- demonstrated international best practice, including in New Zealand and Australia
- a plethora of consultants' reports from 1985 to 2013 recommending that service delivery move to the private sector and State Owned Enterprises (SOEs), with ICI taking on a regulatory, planning and monitoring role.

Conversely there are concerns that:

- the expertise developed to date in road maintenance and sealing could be lost
- experienced road workers could be made redundant
- delays in implementing an SOE are due to inherent viability issues
- that the private sector expectations in terms of price are unrealistic due to limited competition
- there has been limited success with using an SOE approach to manage roads in the Pacific
- there is yet to be a compelling cost benefit analysis, despite all the reports to date.

Any enhancement of the role of the private sector needs to be implemented in a manner that retains and improves the existing skill base within country, but not necessarily within the public sector.

TAU provides a strong precedent for the successful operation of a SOE for a user pays utility in the Cook Islands. There is also clear government commitment to establishing an SOE with a user pays component for water and wastewater with a possible later extension to include solid waste management. However the government has not yet clearly indicated any long term intention to move ICI's in house road construction and maintenance services to an SOE. If the government decides to transfer roading services to an SOE, this could be added to the SOE for water, wastewater and solid waste, to create a Utilities SOE as recommended by a number of consultants reports, including the 1994 Barrett Report. However given the differences in funding mechanism and purpose, combining roads with these other utilities is not recommended. Alternatively a standalone SOE could be created and compete with the private sector for a Network Operations Contract to maintain the road network.

It is important to recognise that ICI does already extensively engage private sector contractors, material suppliers and machinery, project managers and engineers in the construction of roads and bridges and for drainage construction and protection works on Rarotonga. The private sector has very strongly expressed interest in having the opportunity to tender for all road work, including maintenance and in Pa Enua.

The private sector on Rarotonga has also used ICI's bitumen distributor including for chip seal works and preparatory works for hotmix contracts for ICI. It is currently (2016) the only working equipment of this nature in country. Despite this, the private sector does not support ICI in replacing or refurbishing the chip seal equipment, except through an SOE, arguing that road construction and maintenance should no longer be undertaken directly by a government ministry. Nonetheless, government has committed to replace the bitumen distributor truck and mobile kettle, which is scheduled for delivery in January 2017.

Currently the private sector subcontracts back to ICI the work components for which ICI is better resourced in equipment and or skilled personnel. This arrangement could be more appropriately managed through a joint venture or partnership arrangement. Another option would be for ICI to provide specific personnel, as required. Such arrangements should bring clear efficiency gains. They may also give ICI eligibility to apply for ADB Trust Fund Grants for Capacity Building.

8.6 Separating project and programme management from project and programme execution

Development partners and the government's central agencies⁴ advocate for the separation of project and programme design and management from execution. This provides greater transparency and accountability. All capital works undertaken by ICI, except for road maintenance in Rarotonga (which is funded from Capex), currently require Project Design Documentation, prepared by ICI's Planning and Design Division. It is proposed, in the interests of transparency and accountability, to extend this requirement to Rarotonga road maintenance. This is already the case with work undertaken by ICI in Pa Enua to assist the Island Governments.

⁴ in particular, MFEM

8.7 Incomplete, unclear or outdated legislation

The review and overhaul of the existing legislative framework is long overdue. Specifically, there should be clear statutory definitions, supported by regulations, conferring legal responsibility for roads and drainage to ICI (or other organisations as may be determined by Cabinet Minute).

With the impact of climate change, changes in international engineering best practice, advances in technology, as well as changes in the number and type of vehicles and machinery coming into the Cook Islands there is an increasing need to have clearly documented road and road drainage standards which are supported by legislation and regulations.

Existing legislation

'Road' is defined in s604 of the Cook Islands Act 1915 as follows:

“... the term road means a public right of way, or the land which is subject to such a right of way, as the context may require.”

Road is defined in s2 of the Transport Act 1966 as follows:

“Road includes a street; and also includes any place to which the public have access, whether as of right or not; and also includes all bridges, culverts, ferries and fords forming part of any road, street, or place as aforesaid.”

There are no other statutory definitions of 'road'. The more general definition of 'road' in the Transport Act is intended to give the Police jurisdiction over traffic safety and regulation on all roads used by the public. The definition in the Cook Islands Act relates to legal rights of public access. Part 23 of the (New Zealand) Cook Islands Act 1915, is concerned with the relationship between roads and land ownership and provides the legal mechanism for the proclamation of roads by the Crown and for the maintenance of roads on behalf of the Crown.

Section 2 of the Transport Act 1966 also includes the following definitions:

- *“Erecting authority”, in relation to any road, means the controlling authority, and includes the Public Works Departments⁵*
- *“Controlling authority” means the authority, body, or person or persons having control of any road*

The 'erecting authority' is responsible for road signage. The definition of 'controlling authority' is used elsewhere in the Transport Act in relation to road marking and signs only.

Section 121 of the Transport Act empowers *“The chief of Police... to compel owners or occupiers of land adjacent to public roads to cut or trim hedges or trees that he considers dangerous to public safety or which obstructs a clear view of the road.”*

The Rarotonga Water Authority Act 2016 provides for the creation of a SOE to manage water resources in conjunction with landowners. This legislation introduces a new approach to the relationship between the public utility and the landowner, through shared responsibility, which could be considered for roads.

⁵ Now ICI

The proposed Services Reticulation Bill 2017 introduces the concept of a Road Manager with day to day responsibility for a road or roads. It also specifies ICI as the Road Manager for public roads on Rarotonga and the Island Governments as the Road Managers for public roads in Pa Enua.

Difficulty identifying landowners and gaining access to land

The government liaises and negotiates with landowners (or nominated representatives living here in the Cook Islands) to locate or survey boundaries and to gain access onto family land. However, there is a lack of information identifying the owners of land. This results in delays and disputes over boundaries and ownership as ICI and other agencies may negotiate in good faith with people who have not been fully empowered to act on behalf of the landowners. This is not specific to roading, but an issue with land title overall.

Getting access to sufficient land appropriate to the class of road can cause conflict if land requirements are not clearly identified and agreed with landowners before any work is undertaken by the government.

Lack of provision for service and utility easements

The proclamation of a road under the Cook Islands Act 1915 does not provide crown ownership or easements for other services such as power and water utilities. It is best practice to use road reserves for services, however this has, on occasion, been opposed by landowners, particularly in the case of extension to the Ara Metua in conjunction with the laying of the new Te Mato Vai water ring main.

Lack of standards

Currently land set aside for roads in new subdivisions is not required to meet minimum acceptable standards including width requirements. Surveyors recommended that roads should have a minimum width of 6 metres, with more land required for main and secondary roads. However engineering advice is that 6 metres is unlikely to be sufficient for all situations, and that the width will depend on engineering assessments, taking account of the use, provision of utility services, pedestrian and cyclist use and emergency services requirements. Some subdivisions are approved with 4 metre road widths. Existing major roads on Rarotonga have a maximum width of 10 metres which makes it difficult to accommodate utility services, footpaths and cycle lanes or shared cycle / pedestrian paths as these all require minimum widths to be effective.

In Pa Enua, as in Rarotonga insufficient road width and lack of footpaths are a concern. However Island Governments are mindful of the need to retain good community relations in negotiating with the Aronga Mana and landowners to address these issues.

Subdivisions are also being created with extremely steep road access, leading to difficulties for construction and maintenance as well as for road users. Road access over steep terrain is possible but needs to be designed so that the slope or gradient meets standards for trafficable roads.

Standards need to take into account socio-economic and technological changes and trends, such as reduced use of fossil fuels, which are reflected in changes in the vehicle fleet composition and characteristics. Some changes, such as greater use of electric vehicles, will not directly impact on road design. However any simultaneous increase in walking and cycling will increase demands for pedestrian and cycle facilities to be included on all public roads. The technology of 'self-driving cars' is still emerging, and it is not yet clear whether it will have any significant implications for road design.

Resources, including land, are wasted when private roads are located side-by-side on adjacent properties. Although these are not public roads, it is recommended that future subdivision planning

seek to avoid these and instead promote shared access ways. This achieves more efficient use of land and better 'urban design' through improved coordination between neighbouring landowners.

Lack of cycle and pedestrian facilities

Stakeholder feedback has already indicated an increasing expectation, particularly in Rarotonga, that footpaths and cycle lanes should be provided. The drivers for these are:

- Environmental – reducing use of fossil fuels
- Health – promoting physical exercise
- Safety – separating more vulnerable road users i.e. pedestrians and cyclists, from vehicles
- Economic development – aligning with the tourism strategy to encourage tourists to move more slowly round Rarotonga increasing both the total amount and the distribution of their spend.

It will be difficult to negotiate agreements with adjacent landowners to widen all existing roads to provide for separate footpaths as well as cycle lanes. Despite this difficulty, where there is sufficient undeveloped land, acquisition of the additional land required for cycle and pedestrian facilities should be investigated before this is further impeded by development. Alternatively, shared cycle and pedestrian facilities may be the most suitable option.

Roads not aligned with legal boundaries

Existing roads do not always conform to the legal road boundaries. There are instances of public roads encroaching across land boundaries, hence requiring road realignments or changes to the legal boundaries. The Cook Islands survey industry recommend that road alignments which do not follow legal boundaries should initially be left unchanged. However when roads are being rebuilt realignment should be considered at that time to improve road design.

Public vs private roads

It is the intention of this Policy to seek to have all publicly maintained roads proclaimed in terms of the Cook Island Act. There is a need to identify which roads are currently legally proclaimed and gazetted as public roads and which are private roads; as well as identifying roads which should be proclaimed as public roads. At present it is not always clear which roads are public and which roads are private. The status of public car parks should also be clarified as to whether proclaimed as roads; Crown Land; or land leased to the Crown.

It is not clear who is responsible for maintaining some roads, or for constructing new access roads. There are an increasing number of minor (access) roads on Rarotonga which, although constructed and maintained by ICI, are not formally proclaimed as roads. Also, even where the government has initially sealed roads at its expense, this does not always imply landowner acceptance of these roads as public roads, or that there is an ongoing commitment by government to maintain the road. Even when roads are indisputably private it is sometimes expected that the government will maintain the road, based on past practice rather than on any documented agreement. A further complication is that there are some discrepancies between the roads regarded as public roads because the Ministry of Internal Affairs cleans their verges and those regarded as public roads because ICI maintains the road surface.

As a contrast to the expectation that government maintain some private roads, there have been instances of landowners preventing government machinery from rescaling what ICI had perceived to be public roads. There have also been instances where road sealing has been initially financed by tourism development subsidies, but landowners have found it necessary to toll visitors to cover repairs and maintenance.

Where the provisions of the Cook Islands Act have not been invoked but ICI has taken responsibility for constructing and maintaining a road on behalf of the government, it can be argued that legal possession has been granted to the Crown by the landowner. However it should be a key deliverable of the Roads Master Plan to ensure a programme for identifying appropriate de facto public roads for declaration pursuant to the Cook Islands Act.

The broader definition of 'road' in the Transport Act is intended to give the Police jurisdiction over traffic safety and regulation on all roads used by the public. It is not intended to indicate responsibility for management or maintenance of the road itself.

By way of background, it is noted that:

1. A Roads Division Operating Policy dated August 2009, from the former Ministry of Infrastructure and Planning, indicated that:

“consideration will be given to construct an access road only if there is a minimum of three properties (surveyed) planned for development and will only proceed if resources are available”
2. At one time Te Aponga Uira required a minimum of five houses or properties to request access before installing an additional power line. However their current policy is to provide power for even one additional consumer.
3. Access roads to existing water intakes are proclaimed public roads but nonetheless are in some instances not open to all traffic.
4. The marking of tsunami escape routes by Emergency Management Cook Islands is intended for awareness only and not to indicate additional public roads.
5. It is current practice for off street public car parks to be included in road maintenance and construction programmes although from an engineering perspective, these are not roadways.

There needs to be a mechanism for cost recovery where public roads are damaged by commercial vehicle operators, construction equipment, or heavy axle loading on trucks and semitrailers e.g. the quarry road in Arorangi which is frequently damaged by commercial operations and repaired by ICI. It is noted that a significant proportion of total road deterioration is attributed to heavy commercial vehicles as distinct from overloaded vehicle which is a separate concern. The annual licence fee for vehicles, or a portion of it is not currently reserved for road maintenance and construction vehicles are exempt from this fee. It has been suggested that, as in other countries some form of surcharge should be provided for relating to the operation of heavy commercial vehicles.

Where roads are damaged by negligent operation such as operation of non-road compliant vehicles on a public road (such as a steel tracked excavators) cost recovery options should also be considered. It is proposed that this should also include the operation of overloaded vehicles which as well as causing considerable damage to roads are also a significant safety hazard. Legislation needs to be strengthened to provide powers to enforcement agencies relating to the operation of overloaded vehicles and non-road compliant vehicles on public roads

Other utility agencies, including Te Aponga Uira, Bluesky Cook Islands and the proposed Rarotonga Water Authority (currently ICI Water Works), can disrupt the road surface when accessing or laying their underground lines within the road reserve. There are currently no Memoranda of Understanding (MoUs) or established Code of Practice governing this activity, apart from the

requirement to obtain a road excavation permit before excavating a road managed by ICI. The service utilities favour a 'dig once approach'.

No mandate for public roads

There is no clear legislated mandate for the role of ICI in maintaining and constructing public roads on Rarotonga. This includes a lack of procedures to guide and progress development and management of roads. There is also no legislated mandate for the role that ICI takes in providing Pa Enua with technical assistance, advice and guidance on road and road drainage construction and maintenance. This is especially important in Aitutaki and Atiu which already have growing tourism industries.

There is also no clear responsibility for the erection of road name signs and this is now done on an ad hoc basis. This was previously the responsibility of the three former Rarotonga Vaka Councils.

The Solicitor General has confirmed that the legal mandate for ownership and management of roads sits with Cook Islands Investment Corporation (CIIC), notwithstanding the de facto delegation of this authority to ICI through the annual budget and business plan.

For accounting purposes roads are accounted in the books of the Crown and not in CIIC assets. Infrastructure assets, including road networks are recorded at cost less accumulated depreciation⁶.

Safety of workers

The Ministry of Internal Affairs has oversight responsibility for setting safety regulations. However, there are limited resources for health and safety inspections or outreach education programmes.

The safety of the road workers, including contractors, is the responsibility of the employer, as mandated by the Employment Relations Act 2012. Safety is real concern as road users do not always respect warning signage. The adoption, by employers of road workers, of appropriate Working on the Roads Safety Standards, would facilitate the exercise by employers, of their responsibilities for the safety of their employees working on the roads.

Road side maintenance and safety of road users

Hazards can be created when landowners do not trim, move or remove hedges or fences which obstruct the vision of road users, especially at intersections. Such hazards can cause or contribute to crashes. Police are empowered under the Transport Act to control this, but are not always approached when their intervention is required. Police advise that they cannot exercise their enforcement power if the need for hedge trimming is not brought to their attention.

Advertising signboards can also impair visibility and contribute to traffic crashes, and in some cases protrude into the road reserve. There are also blind spots, some of which could be managed with reflective mirrors. Road safety signs and barriers can be a challenge as they are often erected outside of the legal road. Regulations are required to improve safety and better control hazards including advertising signs.

In the past ICI (as the Ministry of Works) trimmed road side trees and hedges, installed road name signs, and cleared bridges and streams. Management of road verge cleaning contracts was transferred, initially to the Vaka Councils, and on their abolition, to the Ministry of Internal Affairs, and this more extensive maintenance no longer occurs. It is important that the verge maintenance

⁶ p19, Annual Report of the Government of the Cook Islands for the Year Ending 30 June 2012

programme is aligned to this policy and to the safe and cost effective operation and maintenance of the road network.

Drainage

Currently there are no restrictions on the discharge of surface water onto roads from adjacent land. There can also be difficulties in obtaining the necessary easements to discharge water off the roads.

The tourism industry raised concerns about contaminants in stormwater running off into the lagoon. This issue is relevant to this policy as some stormwater runoff from road surfaces contains contaminants from vehicles. Currently the 'first flush'⁷ of stormwater contaminants following rainfall is generally managed by the use of swales, grassed drains, wetlands, and grassed basins. More advanced treatment methods may be required in the town centre of Avarua where there is piped storm water as well as relatively greater areas of sealed road surface and higher traffic volumes, and this could be extended to other sensitive areas such as in proximity to the Muri lagoon.

Damage to survey marks

There are control marks (survey marks) on the centre line of the Rarotonga Ara Tapu (Main Road) and the Ara Metua (Back Road) established by cadastral surveyors to orient with the national cadastral survey system. This practice of establishing survey marks in the centre line of the road has occurred for the last 100 years and was also used to determine the centre of the road.

It is becoming increasingly dangerous for surveyors to use the survey marks in their current position. Survey marks are also likely to be buried or obscured by road maintenance works such as resealing, or reconstruction. The survey industry supports the use of valve boxes to protect existing survey marks in roads. They also support the relocation of these marks to safer locations off the road or out of the centreline into one of the carriageways.

Provision for parking

While on road parking has been provided along the sides of the dual carriageway in Avarua town centre, there are no regulations controlling parking, including on road parking. Both ICI and the Police have received complaints and queries about lack of parking and the obstruction of roads by parked vehicles. These concerns particularly relate to regular weekly events such as the Muri night market, and to new developments. It is anticipated that Roads and Road Drainage regulations will include controls for on road parking including restrictions in situations where such parking will cause a road hazard. This may also require amendments to the Transport Act 1969.

With respect to commercial developments both within and outside the town centre, there are no regulations requiring developers to provide on-site (i.e. off street) parking, except when specifically provided for in an Environmental Impact Assessment, which is always on a case by case basis. The review of the Building Code, being conducted in 2017, will address provision of on-site (off street) parking.

8.8 Climate change and emergency management

The Cook Islands is vulnerable to climate change effects and natural hazards such as tsunami, cyclones and other extreme weather events. Road design and maintenance needs to consider sea

⁷ 'First flush' refers to the initial concentration or contaminant loads that are washed off a given surface such as a road, car park or roof during a given rainfall intensity. The rainfall intensity used will vary in each location and is subject to climate change. This initial contaminant loading requires treatment via some form of stormwater treatment process or product that can manage Total Suspended Solids, Hydrocarbons, Copper and Zinc.

level rise, increased incidence and intensity of cyclones, flooding from both rainfall and sea surge, and drought conditions. Climatic conditions can also cause or contribute to sinkholes⁸, underground scouring and subsurface erosion, and road depressions⁹. Although these problems can also be partly due to sub-standard construction techniques or lack of maintenance, the deterioration can be accelerated by climate change.

There is therefore a particular need to integrate emergency management and consideration of the effects of climate change into road planning, design and management. This includes providing for:

- detours to the Ara Metua due to cyclones or tsunamis, and cyclone or tsunami damage
- tsunami evacuation routes
- emergency airport routes
- access for emergency vehicles
- wider roads for responding to man-made events including, but not limited to:
 - major vehicle crashes
 - fires of all types
 - hazardous substance spills
- elevated roads next to coastal areas, responding to sea level rise
- route resilience through the availability of alternative routes
- continued access in an emergency to critical assets, such as water supply installations.

⁸ Unexpected openings or holes that appear in the road. Normally caused by underground water passing through fissures drawing away fine soil particles. Can be due to poor compaction of base course or placement of fill material within former streams and drains.

⁹ Caused by the effect of climatic conditions on roads with poor compaction of base and sub base.

9 Objectives and Policies

9.1 Safe and structurally sound

Objective 1

1. To plan, design, construct and maintain a structurally sound and safe road network using appropriate technology to promote economic development and provide for the social needs of the community.

Policies for Objective 1

- 1.1 Ensure roads and road drainage meet sound environmental and engineering standards.
- 1.2 Plan effectively for the development of the road network including associated cycle and pedestrian facilities.
- 1.3 Effectively develop, schedule and manage all road maintenance, upgrading and capital works, following sound project and asset management principles.
- 1.4 Ensure that effective and co-ordinated methods of managing the placement of services within road reserves or corridors by utility providers are in place
- 1.5 Ensure appropriate Working on the Road Safety Standards, including provision for temporary traffic management and road closures, are adopted and applied to promote the safety of road workers and road users.

Deliverables for Objective 1 and associated policies

The following deliverables, or outputs, are needed as part of the actions to give effect to the objective and policies:

1. Roads and Road Drainage **Regulations** (*additional detail given later in document).
2. A National **Roads Master Plan** – including, but not limited to
 - requirements for determining prioritisation of works
 - details of levels of service in road surfacing e.g. asphalt concrete for heavily trafficked roads compared to chip seal or gravel for low traffic roads
 - clear differentiation between road development in Rarotonga, the Southern Group Islands and the Northern Group Islands so as to take into account local needs, conditions and resources, particularly in selection of construction materials and drainage design
 - planning and design which incorporates safety during the lifecycle of the road asset
 - ensuring road design provides for greater use of cycles (which ideally require protected cycle lanes) and higher pedestrian numbers (requiring safe pedestrian walkways)
 - provision for placement, use and protection of survey marks
 - control of stormwater from roads including treatment of contaminants as required.
3. A fully operational **Asset Management System**, generating Asset Management Plans.
4. The road construction and maintenance **elements of a Pa Enua Machinery Maintenance and Replacement policy**.

5. **A Code of Practice for Utility Operator's access to the Road Reserve** together with **Memoranda of Understanding** with Te Aponga Uira and Bluesky Cook Islands and any future Water or Wastewater Authority regarding their services laid within the road reserve including road reinstatement standards. This will require detailed forward works plans, and ongoing liaison on the execution of these plans by all parties. Where work is being contracted out by ICI, the relevant provisions of the MoU will need to be written into the contract documents and contractors' work programmes.
6. **Workforce development Plan** to build capacity in ICI, Island Governments, and private contractors in asset management, project and programme management, planning and design, and road construction and maintenance.
7. **Working on Roads Safety Standards, including minimum temporary traffic management requirements**, to be followed by employers of those who work on roads.

9.2 Sound governance

Objective 2

2. To establish a sound governance and legal framework, with sustainable financing.

Policies for Objective 2

- 2.1 Define responsibilities for road and road drainage, construction and maintenance, using legislation, regulations, and Memoranda of Understanding.
- 2.2 Develop regulations setting standards for roads and road drainage to ensure that they are fit-for-purpose.
- 2.3 Establish legislative frameworks, clear processes, and consistent practices to eliminate or minimise disagreements between the government and landowners about ownership or maintenance of public roads.
- 2.4 Separate planning and design of road works, including maintenance, from implementation and construction to increase transparency and accountability.
- 2.5 Establish clear frameworks for use of private sector resources including partnership arrangements.

Deliverables for Objective 2 and associated policies

The following deliverables, or outputs, are needed as part of the actions to give effect to the objective and policies:

1. New or updated **legislation** which:
 - mandates clearly the responsibility for maintenance and construction of public roads, and for the management of the asset on behalf of the Crown, including road signs, road name signs and hedge trimming
 - provides for easements for utilities in the road reserve to provide for installation, and operations without requiring additional negotiation with landowners
 - restricts maintenance done by the government or its contractors, to public roads only

- empowers road managers of public roads to clear back private hedges and tree branches so that these do not encroach onto roads and obscure vision, especially at intersections
- provide for axle weight controls, weighing of vehicles, and levying of surcharges to the annual vehicle licence for operating heavy commercial and vehicles likely to cause road damage, which surcharges will be applied to future road maintenance
- empowers the introduction of regulations giving effect to the legislation.

2. Roads and Road Drainage **Regulations**, including:

- restrictions on:
 - use of public roads for commercial activities
 - road cutting - requiring forward planning to install underground service ducting
 - use of public roads by construction vehicles, including use of tracked machinery and farm machinery on sealed surfaces
 - overloaded trucks and semi-trailers on roads
 - discharge of water onto roads
- setting minimum design standards for roads and road drainage easements created in subdivisions
- specifying minimum geometry including but not limited to horizontal alignment and gradient requirements (i.e. steepness)
- clear requirements to consult with all affected landowners and other stakeholders (e.g. nearby businesses) when creating easements for roads and road drainage and other public utilities
- clear provisions for managing on road parking, including imposing restrictions where necessary
- clear provisions for the naming of roads.

3. **Memoranda of Understanding** between government agencies to:

- clarify roles and responsibilities
- ensure consistent processes and understanding
- improve mechanisms for identifying landowners to consult about road and utility easements.

4. **Subdivision Regulations** to ensure subdivision plans receive and consider inputs from relevant government agencies including vetting by engineers so as to ensure adequate:

- road widths, locations and road geometry
- splays/chamfers at road intersections
- road alignments on hilly/sloping land
- requirements for acceptance prior to proclamation of a public road

5. **Public information material** advising residents or landowners of the process for converting private roads to public roads through the proclamation process.

6. **Heavy vehicle surcharges** -additional payments by owners of heavy commercial and construction vehicles to ensure that these responsible for damaging roads contribute to the cost of repairing them.

7. **Road damage cost recovery** , where roads are damaged by negligent operation such as operation of non-road compliant vehicles on a public road (such as a steel tracked excavators) or the operation of overloaded vehicles.

8. **Separation of programme design and management from execution, including maintenance,** within ICI as a first step towards these functions being performed, in the future by different agencies.
9. **Adoption of a staged approach towards increased private sector involvement in road maintenance,** including establishing standards for contractors and developing capabilities such as asset management plans and traffic counting software, for appropriate oversight and monitoring of works.

9.3 Emergency management and climate change

Objective 3

3. To provide for emergency situations and plan for the effects of climate change.

Policies for Objective 3

- 3.1 Integrate emergency management and consideration of the effects of climate change into road management planning.
- 3.2 Work with Emergency Management Cook Islands to educate the public about the emergency routes as the present signage is intended to be indicative only.
- 3.3 Mainstream climate change and emergency resilience into road design and construction standards, so as to strengthen roads and bridges against the impacts of cyclones and tsunamis.
- 3.4 Ensure road designs provide appropriate cycle and pedestrian facilities to promote greater walking and cycling as forms of transport with less environmental impact, i.e. without any carbon emissions, thereby mitigating climate change

Deliverables for Objective 3 and associated policies

The following deliverables, or outputs, are needed as part of the actions to give effect to the objective and policies:

1. **Emergency Response Plans** including:
 - associated public education about the purpose of marked tsunami routes
 - review of the emergency resilience of access routes to critical infrastructure assets such as water supply.
2. Components of the **National Roads Master Plan** relating to road design and emergency resilience including provision for vulnerable road users in particular cyclists and pedestrians.

10 Timeframes for deliverables

The following table sets out the estimated timeframes for completing the deliverables referred to in section 9.

Deliverable	Responsibility	Due date	Cross Ref ¹⁰
Draft Working on Roads Safety Standards for consultation with employers of workers working on roads.	ICI	2017	D7 for O1

¹⁰ These cross-references are to the deliverables and objectives in section 9. D = Deliverable, O = Objective

Deliverable	Responsibility	Due date	Cross Ref¹⁰
Pa Enua Machinery Maintenance and Replacement Policy (road construction and maintenance elements)	OPM / IGs / ICI	2017	D4 for O1
Code for Utility Operator's Access to Road Reserves, together with Memoranda of Understanding with Bluesky and Te Aponga Uira regarding their services laid within the road reserve	ICI / TAU / Bluesky	2017	D5 for O1
Adoption of a staged approach towards increased private sector involvement in road maintenance	ICI	2018	D8 for O2
Subdivision Regulations	ICI / Chief Surveyor's Office	2018	D4 for O2
Public information material about road regulations and responsibilities	ICI	2018	D5 for O2
Public information material and education about marked tsunami routes	EMCI	2017	D1 for O3
Road and Road Drainage Regulations	ICI	2018	D1 for O1 D2 for O2
National Roads Master Plan	ICI	2018	D2 for O1 D2 for O3
New or updated legislation	ICI	2018	D1 for O2
Workforce Development Plan	ICI	2018	D6 for O1
Memoranda of Understanding with government agencies	ICI	2018	D3 for O2
Road user damage surcharges	ICI	2018	D6 for O2
Asset Management System (fully operational and with fully supported software)	ICI / CIIC	2019	D3 for O1
Separation of programme design and management from execution'	ICI	2019	D7 for O2

11 Monitoring and evaluation

Sufficient resources need to be in place through the Roads Master Plan to ensure that data is recorded in a timely fashion and that meaningful information can be provided if required or upon request. ICI is responsible for the monitoring of the deliverables, and ensuring that meaningful information is communicated to the public when required.

Evaluation contributes to continuous improvement and it is necessary to ensure that evaluation is carried out on a regular basis. Progress towards the deliverables set out in this policy will be reported on in the ICI Business Plans and Annual Reports and should also be evaluated on a four yearly basis or earlier if required.

The first evaluation should take place four years from the date of endorsement of this policy.

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Appendix 1 Key stakeholders who provided feedback

ICI acknowledges the inputs given by the following stakeholders:

- Airport Authority, Rarotonga Fire Rescue
- Asian Development Bank
- Bluesky Cook Islands
- Cook Islands Chamber of Commerce
- Cook Islands Civil Society Organisations Inc. (CICSO)
- Cook Islands Investment Corporation (CIIC)
- Cook Islands Police Service
- Cook Islands Red Cross Society
- Chief Surveyor
- Civil engineering consultants and contractors
- Crown Law Office (CLO)
- Deputy Prime Minister (Minister of Infrastructure)
- Island Governments:
 - Mangaia
 - Mauke
 - Palmerston
 - Penrhyn
 - Pukapuka-Nassau
 - Rakahanga
- Ministry of Finance and Economic Management (MFEM)
- Ministry of Health (MoH)
- Ministry of Internal Affairs (INTAFF)
- Ministry of Justice (MoJ)
- Ministry of Transport (MoT)
- National Environment Service (NES)
- New Zealand High Commission, Rarotonga Cook Islands
- Office of the Prime Minister:
 - Central Policy and Planning Office
 - Climate Change Cook Islands
 - Emergency Management Cook Islands
 - Pa Enua Division
- Office of the Public Service Commissioner
- Institution of Professional Engineers Cook Islands (IPECI)
- Road Safety Committee
- Road Safety Council
- Solicitor General
- Survey industry
- Te Aponga Uira (TAU)
- Teimorimotia Volunteer Fire Rescue
- Te Koutu Nui
- Te Ipukarea Society (TIS)