

SM012 State Highway Controls and Operations Manual

Part 2 – Consolidated Asset Management Sections

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1.0 Management of the State Highway Network

1.1 NZTA Administrative Service

NZTA is responsible for the provision of administrative services for the management of the State highway network.

1.2 NZTA Service

NZTA itself will provide technical, administration, planning, and legal servicing as required to protect and manage the State highway asset. This service will be in accordance with the GRP Act, *State Highway Control and Operations Manual*, NZTA, and the *PIKB*, and is generally of an administrative nature.

NZTA will arrange for other professional services used to assist in statutory control or for the investigation, design and supervision of physical work on State highways.

1.3 Provision of Professional Services

The provision of professional services to assist in statutory control or for preparing or carrying out of State highway maintenance, works and property management shall be obtained by an approved tendered competitive pricing procedure developed in accordance with the Land Transport Management Act s27.

1.4 Provision of Physical Works

The provision of all physical works on State highways and ancillary property shall be obtained by an approved tendered competitive pricing procedure developed in accordance with the GRP Act section 90.

1.5 Delegation of NZTA Powers to Territorial Local Authorities (TLA)

The GRP Act section 62 provides that all or any of the functions, duties and powers of construction, maintenance and control conferred on the Board with respect to any State highway or portion of State highway may be delegated by the Board to the TLA in whose district the State highway is situated.

Such delegation can only be by mutual consent and the full power and control over State highway policy remains with the Board, and every delegated TLA shall comply with such policy.

Guidelines on delegation of State highway functions to TLAs are given in Part 13, Appendix G12, *Guidelines for Delegation of Functions to Territorial Local Authorities*.

2.0 Highway Distance Marking, Inventories, Data Recording, Traffic Characteristics and Culvert Marking

2.1 Introduction

This section specifies the procedures to be followed to record the location, type and condition of each separately identifiable portion of the State highway asset.

2.2 Responsibility

System Managers and Alliance Manager (WTA) are responsible for ensuring all State highway distance marking, inventories and data recordings are maintained.

2.3 Distance Measurement

All State highways shall be marked out in accordance with *Location Referencing Management System Manual*, NZTA.

This manual states requirements for all business processes associated with managing network changes.

The distance measuring system shall be used to reference all features and ongoing activities occurring on the State highway network.

2.4 Maintenance of Distance Marking System

Distance marking signs and roadmarkings shall be maintained to the standard specified in *Location Referencing Management System Manual*, NZTA.

2.5 Highway Information and Route Data Sheets

Highway information sheets give a pictorial and tabular description of the highway features.

Route data sheets give a tabular distance listing of significant features on or abutting the highway.

Both systems provide a quick, user friendly reference for frequently used highway data.

Highway information sheets shall be compiled in accordance with the *Guideline for Preparation and Validation of Highway Information Sheets (HIS)* - Connell Wagner 1994.

2.6 Maintenance of Highway Information and Route Data Sheets

These sheets are generated directly from Road Asset and Maintenance Management (RAMM) asset data, so it is important that the asset data is completely updated as at the 30 June each year. Copies of the sheets can be accessed directly on-line.

Network Managers are responsible for ensuring that the asset data in RAMM is sufficiently complete so that the data presented on these sheets represents a meaningful picture of each road section.

Refer to LRMS Manual for other business processes associated with updating highways/roads.

2.7 Inventory Information

In addition to the pictorial information provided by the highway information sheets, System Managers shall also ensure other inventory data are maintained as follows:

- (i) Aerial photographs of the State highways.
- (ii) Traffic volumes and vehicle classifications (using the TMS system).

- (iii) RAMM Inventory, Condition Rating, Maintenance Cost and Traffic Information.
- (iv) State highway lighting installations maintained by NZTA.
- (v) State highway traffic signals installations maintained by NZTA.
- (vi) State highway railway level and grade-separated crossings.
- (vii) State highway roadside landscaping areas maintained by NZTA.
- (viii) Major retaining or drainage structures.
- (ix) State highway stopping places.
- (x) State highway weigh stations, weighpits and WIM sites.
- (xi) All asset maintenance delegated to territorial local authorities (TLA), the TLA involved and their contact people.

All data shall conform, where applicable, to the *State Highway Database Operations Manual* (SM050).

2.8 Traffic Characteristics

System Managers shall, in liaison with the Data Management Team, Technology Engineering, maintain a network of sites and equipment for monitoring directional traffic characteristics such as hourly volumes, urban 15-minute peak volumes, speed, composition, axle loading and seasonal variations.

System Managers shall ensure all data is entered into the TMS system continuously throughout the year. This data is summarised in the Traffic Management System on-line. All Offices are responsible for ensuring the correct transfer of traffic data into RAMM.

3.0 Road Asset and Maintenance Management (RAMM) Systems

3.1 Introduction

The NZTA uses a number of systems for asset and maintenance management. Key systems in use are RAMM (core asset database), TMS (core traffic data) and dTMS (asset management planning tool). The use of these systems is mandatory for all State highways.

3.2 Key Purpose of Systems

The systems are used in order to assist with asset management. In this regard, they must be up to date so that:

Management decisions are made based on an objective and auditable approach. Management reports can be produced for a wide variety of stakeholders (particularly Ministry of Transport and members of public). Data for such decisions and reports will be required from time to time by regional offices, consultants and the Wellington Office and it is therefore important that a regular update and audit cycle is achieved.

3.3 Information on Use of Systems

Information on use of the systems is described in more detail in the following publications:

- State Highway Database Operations Manual (SM050) - this describes the key responsibilities for maintenance of the RAMM database and includes the Asset Information Annual Planner for deliverable dates (see below)
- Traffic Monitoring Manual (SM052) - describes the methodology for traffic counting
- Annual Plan Instructions (SM018) - describes the requirements for delivery of the 10-year forward works programme
- Location Referencing Management System Manual (SM051) - describes the process for maintaining the road location referencing and network model (including information processes when the network is updated) dTMS Setup Release Instructions - these are issued annually around the time of the annual plan instructions giving more details on the use of dTMS for the year.

3.4 Timeframe for Deliverables

The Asset Information Annual Planner (AIAP) is updated annually and released in January as an update to the SHDOM. It shows the key dates for ensuring that the flow of information from consultants and contractors, through NZTA Offices, to Wellington Office is achieved.

Given the number of parties involved in the process, it is impractical to quote single dates for deliverables. Instead, a timeframe for each deliverable milestone is shown (typically one to two weeks). Contract Managers and consultants should aim to deliver outputs by the earliest date shown (and no later than the latest date) and Wellington Office will turn around outputs in the order received, to ensure Wellington Office delivers back to the other offices within the designated timeframes. NZTA Contract Managers should inform Wellington Office of their expected deliverable dates in advance so that Wellington Office can anticipate and efficiently manage the database updates.

3.5 Key Maintenance and Operations Team Responsibilities

The key responsibilities of the Maintenance and Operations teams (and their supporting network operations contractors) are as follows, with the relevant system shown in brackets:

- Delivery of the annual condition rating survey - this supports the high-speed data in describing the condition of the network (RAMM)
- Delivery of maintenance cost data - this enables better understanding of where maintenance effort should be focused in future (RAMM)
- Delivery of inventory updates - to ensure the database is comprehensive (RAMM)
- Delivery of traffic data - to identify network use (RAMM and TMS)
- Delivery of the ten-year forward works programme in order to demonstrate an objective and auditable approach is being taken to network management (RAMM and dTMS)

3.6 Key Wellington Office Responsibilities

Key Wellington office responsibilities are:

- Delivery of high-speed road condition data (roughness, texture, skid resistance, rut depth and various geometry data)
- Update of the road centreline/network model (supported by information from NZTA offices)
- Various national reports and publications throughout the year, using data from the systems

3.7 Releasing Data

When RAMM data – or any similar database information - is released to persons other than NZTA's consultants, the following procedures shall be undertaken:

1. All RAMM data shall be produced by direct printout from the RAMM database.
2. An appropriate NZTA staff member, working independently of the person producing the data, shall check the data.
3. In addition, SCRIM data shall be released only in accordance with the "Basis for Release of Data" in section 4.2 below, attached under cover of a letter bearing the NZTA letterhead and signed by an appropriate NZTA staff member.
4. No data may be released without an appropriate disclaimer attached to the data.

The required documents must be attached to all data released to a person other than NZTA staff or consultants working for NZTA who have a contractual obligation to comply with NZTA's policies.

4.0 Attachment to SCRIM Data Releases

4.1 In this Section

This section contains the basis upon which information supplied by NZTA or its consultants is released and notes to assist with the interpretation of skid resistance data.

4.2 Basis for Release of Data

Information supplied by NZTA or its consultants is released on the following basis:

1. A Sideways Coefficient Routine Investigation Machine (SCRIM) is used to measure the data used for the State Highway Skid Resistance summary.

Older data is recorded as Mean Summer SCRIM coefficient (MSSC) data. Recently data has also been corrected for between year variations. This data is recorded as Equilibrium SCRIM Coefficient (ESC) data. This data is prepared for the routine network wide monitoring of the skid resistance of surface aggregate. It provides comparative information. While it gives an indication of areas where surface repairs may be required it is only one of the indicators used for that purpose. Caution must be exercised if attempting to draw other conclusions from the data or using it for other purposes.

2. While every care has been taken in the measurement, recording and retrieval of the information no guarantee can be given as to the accuracy of any of the data.
3. Interpretation of the data requires expert judgement. Persons with appropriate expertise should be engaged to assist with interpretation.

4.3 Notes to Assist with the Interpretation of MSSC Data

The Vision Zero Strategy has set targets to reduce fatalities and serious injuries from road crashes. An action taken to assist in realising these targets is the provision and maintenance of reasonable levels of skid resistance on the road surface. As a consequence, NZTA endeavours to undertake a skid resistance survey of the State highway network on an annual basis during the summer period (November to March) when skid resistance levels are generally at their lowest. The following is a general outline of the methodology.

- This survey generally involves measurement of wet skid resistance in both wheelpaths, for both directions of travel. On multilane roads at least the left-hand lane is surveyed, since this is usually the location of the lowest skid resistance because it is generally most used by heavy vehicles. The data acquired is used to assist with decision making associated with road maintenance management and to evaluate achievement against road condition targets.
- Measurement of the wet skid resistance and other road condition factors of the highway network is made with SCRIM+. SCRIM+ is basically a 10-tonne water tanker carrying sufficient water for about 60 km non-stop self-wetting skid testing and fitted with two skid test wheels, one for each wheelpath plus other equipment to record road shape. The test wheel is a treadless (blank), pneumatic tyre with its own load and suspension system that is angled at 20 to the direction of travel. A controlled jet of water wets the road surface immediately in front of the test wheel, which is free to rotate in its own plane. Therefore, as the vehicle moves forward, the test wheel scuffs in the sideways direction. The ratio of the force developed perpendicular to the plane of rotation (the side force or cornering force) to the load on the test wheel, is measured continuously along a road and stored as a mean value over lengths of 10m. This ratio is known as the sideway-force coefficient (SFC). Road shape features are also measured and stored.

- The conditions of measurement and tyres used do not represent any particular car or truck. However, the SFC data is representative of the wet skid resistance performance of road surfaces and is utilised by NZTA to monitor the skid resistance performance of pavements.
- SFC values of road surfaces change significantly as a result of short-term and long-term variations in weather conditions, temperature measurement speed etc. Correction factors are therefore applied to bring the SFC data to a common basis for comparison purposes. SFC data standardised in this way is termed the MSSC. The MSSC represents the average value of skid resistance (SCRIM) expected during the summer. It is also close to the minimum skid resistance during the year. MSSC data that has been corrected for between year variations is called ESC. ESC data is used by NZTA as input to its *in-house* analysis routines, which have been developed to aid in the identification of sites that could potentially benefit from increased levels of wet skid resistance and assist with programming of future maintenance work. SCRIM data held in the RAMM database by NZTA is released to third parties in MSSC or ESC form only.
- Although MSSC represents a very important factor in determining the level of wet road safety, it is by no means the only one. Other factors considered in making road maintenance management decisions include crash histories, possible temporary pavement contamination, texture depth, rutting and roughness, traffic characteristics, road geometry, and driving difficulty. The safety of a road section is the result of the interaction of many factors. Therefore, NZTA and its network management consultants consider all factors when determining whether or not a road section needs treatment.
- Road surface skid resistance is highly time and season-specific. Caution must be exercised when using ESC data to assess whether or not the road surface might have been a causal factor in a crash as it is unlikely that the time of the survey will coincide with that of the crash. Furthermore, although MSSC values are similar to *locked wheel* coefficient of braking friction values obtained by NZ Police, they are not directly related. As a consequence, processing of MSSC data for use in crash reconstructions or comparisons with Police investigations should only be attempted by experienced personnel who are fully aware of the limitations of measurement methods and conversion procedures.

5.0 Stock and Fencing on State Highways

5.1 Introduction

This section outlines:

- NZTA's requirements for fencing adjacent to State highways; and,
- the conditions under which NZTA will allow utilisation of the roadside reserve for:
 - stock grazing;
 - cropping; and
 - stock races.

5.2 Boundary Fencing

NZTA will erect boundary fences at its cost where highway improvement or maintenance activities either disturb existing fences and/or necessitate the erection of new fences.

Maintenance of existing fences is generally a landowner responsibility, except where damage to a fence has been incurred by a road vehicle, in which case the landowner is entitled to recover the repair cost from the driver of the vehicle.

Where activities on land adjoining a highway impact on, or have the potential to impact on road safety or management, then NZTA may require the landowner to adequately fence the land adjacent to the highway in accordance with section 61(2) of the Government Roading Powers Act. The System Manager shall take the following issues into account when determining whether land is adequately fenced:

1. the stock related accident rate in the area;
2. report and complaints of wandering stock in the area;
3. rural fencing standards as defined in the Fencing Act 1978; and,
4. the common practice in the area in relation to fencing.

NZTA will fund fencing changes where there are demonstrable road safety or road management benefits of erecting fences to a standard different to that required by the landowner. In these situations, it is generally expected that the fencing details will be agreed with the adjoining landowner before the fence is erected.

5.3 Fences on Motorway

NZTA requires the owner or occupier of any land not separated from an existing live motorway carriageway by a sufficient fence to enclose the land with fencing appropriate for the land use and to the satisfaction of the System Manager.

Exceptions to this requirement are:

- where a rural area adjacent to an existing motorway is rezoned as urban and existing open-strand fencing needs to be replaced with urban standard fencing appropriate for the land use, or
- where NZTA had a prior Resource Consent requirement to provide a noise fence and the noise fence needs to be maintained in terms of such consent.

NZTA shall ensure, by arrangement with authorities responsible for adjacent areas, that continuous fencing to an appropriate standard will prevent public or animal access to existing motorway

carriageways or by providing required fencing where NZTA has an obligation to do so and where the absence of fencing would place the public at risk.

5.4 Unfenced Sections of State Highway as Common Practice

If the common practice in the area is not to fence, then the System Manager, shall establish the extent of any stock grazing in the area and the likelihood of such stock wandering onto the State highway. The System Manager shall ensure that appropriate measures are taken to warn road users of the likely presence of stock on the State highway including the use of permanent signs as specified in NZTA's *Traffic Control Devices Manual*.

5.5 Stock Grazing, Cropping and Stock Races Within the Road Reserve

The System Manager may permit grazing, cropping or the establishment of stock races in suitable areas of road reserve on low volume State highways, by means of the erection of encroachment fencing within the road reserve, subject to conditions set out in the next two clauses, depending on whether it is a permanent or temporary measure.

5.6 Permanent Stock Grazing, Cropping and Stock Races Within the Road Reserve

Approval for the permanent use of the road reserve for stock grazing, cropping or a stock race shall be subject to:

1. the fencing being of an appropriate standard for rural fencing as defined in the Fencing Act 1978;
2. the fencing being positioned so as to not compromise road safety and road maintenance operations; and,
3. the completion of a *Licence to Occupy Road* (letter form).

5.7 Temporary Stock Grazing, Cropping and Stock Races Within the Road Reserve

A temporary fence for stock grazing, cropping or a stock race shall be subject to:

1. the fencing being positioned so as to not compromise road safety and road maintenance operations;
2. any stock held within temporary fences being removed at night; and,
3. the completion of a *Licence to Occupy Road* (letter form).

The use of electric fences is permitted.

5.8 Stock Races

Additional conditions to be satisfied before the System Manager, allows stock races within the road reserve are:

- there is adequate room and visibility to avoid any safety risks or damage to the State highway;
- any stock race is limited to the frontage of property owned by the applicant, unless the owner gets written permission from the owner of the land adjacent to the road reserve over which the applicant wishes to have a stock race;
- the boundary fence is retained; and,
- any gate constructed is only for right angle crossing of the State highway.

5.9 Form of Agreement

The System Manager shall approve and be party to an agreement before any fence is created in the road reserve. The following table details the three components of an agreement:

Table 1: Components of an Agreement

Nº	Item	Description
1	Licence Form	Standard <i>Licence to Occupy Road</i> (letter form) on pages 36 to 43 below.
2	Plan	A4 size and to scale. Details required are: <ul style="list-style-type: none">location of road centreline and seal edges;location of proposed fence line (in red); and,route positions.
3	Cross Section	To scale. Dimensions are required for: <ul style="list-style-type: none">road centreline;lane lines;seal edge;water channel and invert;any service pole line;proposed fence line; and,existing boundary fence.

5.10 Guidelines for Consideration

The following points should be considered and defined in relation to fences encroaching on the road reserve:

1. the type of fence is to be specified in the licence;
2. fences should not obstruct or restrict the width needed to form and maintain adequate surface water channels;
3. where possible fences should be located on the highway side of any service pole;
4. a five metre clearance from seal edge of road is desirable;
5. abrupt irregularities in the fence are to be avoided; and,

6. strainer posts that may be traffic hazards are not permitted within safety clear zones, as defined in the Geometric Design Manual.

5.11 No Rental Charge

Whether the fencing is temporary or permanent, NZTA will not charge a rental or seek to recover administration costs for the occupation of land within the road reserve of a formed road for grazing, cropping or use as a race.

5.12 Existing Gateways

Fences at existing gateways with vehicle crossings are to be returned to the existing boundary fence. No additional gateways will be permitted on the crossing.

5.13 Additional Gateways

Additional gateways must be sited on the existing boundary and fences returned as for existing gateways.

5.14 Limited Access Roads

The purpose is that no additional numbers of gateways should need to be permitted. The target should be to encourage landowners to consolidate and thereby reduce existing gateways numbers, improve access standards and increase road safety. However, it is recognised that due to farm changes such as subdivisions and use changes there may need to be compromises, but staff should encourage trade-offs to advance the target by means such as encouraging moving and combining existing gateways.

5.15 Utility Authorities

Applications are to be referred to affected utility authorities for any additional requirements. The process is to be managed in accordance with the “National Code of Practice for Utility Operators’ Access to Transport Corridors”.

5.16 Number of Forms Required

Two copies of the proposed form of agreement (including the *Licence to Occupy Road*, plan and cross section) are required. Copies of the completed forms of agreement will be forwarded to:

1. The local NZTA office; and
2. The Grantee.

6.0 State Highway Proposed Works Affecting National Parks, Reserves and Conservation Areas

6.1 Purpose

This guidance has been prepared by the New Zealand Transport Agency (NZTA) and Department of Conservation (DOC) to ensure both agencies' statutory objectives are met when planning, constructing, and maintaining state highways within or adjoining national parks, reserves and conservation areas.

The guideline attempts to prevent any potential for conflict between the efficient operation of the State highway network and potential detrimental effects on national parks, reserves and conservation areas managed by DOC.

6.2 Related Documents

Any State highway work within or adjoining national parks must address the General Policy for National Parks (2005) and the relevant National Park Management Plan (NPMP). State highway work within any reserves or conservation areas must address the Conservation General Policy (2005) and any relevant conservation management strategy (CMS) and conservation management plan (CMP).

The State Highway Asset Management Plan, Planning Policy Manual, Environmental Plan and Corridor Management Plans (where applicable) must also be addressed.

Information on and links to related documents can be found in Appendix G14.

6.3 General Maintenance and Operational Criteria

Maintenance work is essential to ensure NZTA meets its statutory objective. Work should be carried out in accordance with NZTA's *State Highway Maintenance Contract Proforma Manual* (SM032) and all necessary resource consents.

Maintenance staff are to carry out their normal tasks within the area defined by the drainage channels on either side of the carriageway, including culvert inlet and outlet channels, provided this does not cause adverse environmental effects or significant changes to drainage.

6.4 Sensitivity

Maintenance activities must be consistent with NZTA's Environmental Plan and have regard to the relevant NPMP, CMP or CMS. In particular, maintenance must ensure visual quality and ecological values are maintained. Furthermore, attention to the following is required:

1. Vegetation adjoining State highways shall be trimmed back to meet the needs for safe passage of all State highway users while maintaining the ecological function and visual quality of the area as far as practicable.
2. For guidance on the disposal of trimmed vegetation and the application of chemical control refer to Network Operations Contract specification section on National Parks, Forest Estates and Reserves, and Other Controlling Authorities.
3. Stockpiles of materials shall not be in the direct eye of the passing public and if within public conservation land will require authorisation from DOC.

4. Both parties will endeavour to ensure biosecurity responsibilities are met and to source weed free (plant and seed) materials for NZTA to use on construction or improvement works. If weed infestation does occur on State highway sites, NZTA will remedy any adverse effects.

6.5 Early Engagement

For any work within, through or adjoining a national park, reserve or conservation area (collectively, public conservation lands) early discussion or ongoing consultation and involvement in decision-making is required between NZTA and DOC.

6.6 Planning

When planning new State highway works (whether construction, improvement or maintenance), both agencies should work together to ensure statutory objectives are met. The objectives of each agency are outlined in the NZTA/DOC Memorandum of Understanding (MOU) (see Appendix 1 of the MOU dated July 2020).

To ensure a partnership approach is maintained, there should be early consultation on any proposed works between both parties. This is to ensure the planned State highway development or improvement is consistent with the:

- Resource Management Act 1991;
- Land Transport Management Act 2003;
- Government Roading Powers Act 1989;
- National Parks Act 1980;
- Conservation Act 1987;
- Reserves Act 1977; and
- policies and plans [and Standard Operating Procedures] prepared under these Acts by either party.

Early consultation is to seek agreement in line with the needs of business cases and any existing scheme assessment reports or other relevant reporting. This includes consultation required by any public and/or statutory process, for any proposed works, and consultation in respect of State highway provisions within CMS, CMP and NPMP.

6.7 Environmental Effects

New or upgraded State highways will be planned, designed, constructed and maintained to ensure works and activities avoid, remedy, or mitigate effects on natural character, historic values or landscape features and on public use and recreational facilities (e.g. tracks, structures). This includes but is not limited to:

- avoidance of fragmentation of habitats and ecosystems where possible, including culvert replacements allowing unimpeded fish passage;
- rehabilitation of surfaces of earthworks;
- avoiding pest plant and weed introduction and providing weed control; and
- collecting and treating stormwater run-off beyond statutory requirements if deemed necessary by NZTA and DOC staff.

Where possible, DOC will also assist NZTA by identifying suitable pest and weed-free sources of road materials in NPMP/CMP/CMS, within public conservation land.

Environmental effects of construction or improvement (including maintenance works) of any state highway shall be assessed in line with the Agency's environmental and social responsibility standard (see <https://www.nzta.govt.nz/roads-and-rail/highways-information-portal/technical-disciplines/environment-and-social-responsibility/national-standards-guidelines-and-specifications/esr-standard>).

An Assessment of Environmental Effects (AEE) is required for all projects in line with the Resource Management Act 1991 (RMA) and/or Conservation and National Parks Act (1987 and 1980) requirements. The coverage and detail of the AEE will reflect the scale of the project / works. In addition to the statutory requirements, the AEE should outline any objectives and functions of the state highway. Probable effects shall be assessed and addressed in line with the NZTA's environmental policy and planning documents, guides, standards and specifications (see <https://www.nzta.govt.nz/roads-and-rail/highways-information-portal/technical-disciplines/>). Particular focus will be on:-

- Ecological quality and processes;
- Landscape values;
- Cultural and historic values; and
- Character and values of national parks, reserves and conservation areas.

The AEE should address the statutory purpose for which the land is held and the relevant provisions of any NPMP, CMP or CMS guides and standards provided by DOC on assessing animal and plant conservation values (see <https://www.doc.govt.nz/Documents/science-and-technical/sfc327entire.pdf>).

The NZTA requirements for environmental and social management plans (ESMP's) applies to all projects scaled to the issues (see <https://www.nzta.govt.nz/roads-and-rail/highways-information-portal/technical-disciplines/environment-and-social-responsibility/management-plans/>). Where projects are considered high risk and or traverse areas of particularly high natural and cultural values a specific environmental management plan covering controls to be used shall be developed and agreed between that parties.

6.8 State Highway Operation Standards

Standards adopted for State highway improvements within or adjoining public conservation lands must be commensurate with the qualities of the park, reserve or area through which the State highway passes and with its transportation function.

To maintain adequate transport capacity and safety, the road corridor cross-sections adopted must allow for seal widths to normal standards used elsewhere on rural State highways, except where significant natural, historic, landscape or recreational values need to be preserved. In these cases a smaller width may be acceptable provided safety is not compromised.

To ensure these issues are addressed an assessment of the character of the affected area shall be undertaken to identify any special needs for corridor management that addresses high values (e.g. vegetation or habitats). Controls (non-standard) can include tailored vegetation clearance through the corridor with specific controls for unique plants and habitats, and extra controls in dealing with pest plant / organism issues (e.g. material handling and disposal including equipment cleaning). Controls for historic, landscape or recreational values may include assess management, avoidance of certain activities or implementation of multi modal transport systems.

Land to provide shoulder and drainage for the operation of the State highway will be sought as well as additional width on corners for seal widening. Extra width may be sought due to the environmental conditions that affect the State highway.

6.9 Signage

All signs should be placed to meet safety requirements for road users on the State highway and should not obstruct scenic views. The design, placement and appearance of official signs within the State highway reserve are subject to standards and rules. NZTA is obligated to provide official signs under the Land Transport Rule: Traffic Control Devices and by virtue of its role under the Land Transport Management Act 2003.

The NZTA Manual of Traffic Signs And Markings (MOTSAM), the Traffic Control Devices Manual, the Variable Message Signs Guideline and the State Highway Control Manual, all provide guidance on design, size and location of official signs, whilst third party signs, including advertising signs are controlled by the New Zealand Transport Agency.

See Signs on State Highways) Bylaw 2010 and amendments:

<https://www.nzta.govt.nz/assets/resources/Bylaws-state-highway/Bylaw-2010-New-Zealand-Transport-Agency-Signs-on-State-Highways-Bylaw-July-2010.pdf>

Additional policy and guidance can be found in the Planning Policy Manual (See <https://www.nzta.govt.nz/resources/planning-policy-manual/>). DOC also has guidance on appropriate signage on public conservation land.

Consultation between DOC and NZTA should occur where the following is proposed:

- DOC signage is to be placed on public conservation land near to a State highway;
- NZTA signage on State highway land, other than for road safety (such as general information signs), to be placed adjacent to public conservation land;
- Non-NZTA signage (e.g. fish and game signs) placed on State highway land, and which requires approval by NZTA; or
- Third party information or advertising signage, to be placed on public conservation land visible from a state highway.

The purpose of this consultation is to avoid conflict between public conservation land values, State highway user safety and visual quality.

6.10 Authorisation for Use of Public Conservation Land

Where capital projects or maintenance works need to be undertaken on public conservation land, unless specified within agreed management plans, NZTA will need appropriate authorisation from DOC to undertake the work. Examples of some of the types of works which may require authorisation are:

- Realignments or road widening;
- Disposal of cut-to-waste material from a seal widening;
- River bank protection;
- Clearance and management of accumulated snow and ice;
- Stockpiling;
- Erection of snow fences;
- Culvert extensions;
- Management of pest organisms; and

- Geotechnical borehole drilling.

6.11 Emergencies

DOC will aim to provide to NZTA with locations of known significant natural or historic sites within public conservation lands. NZTA will provide this information to its staff and contractors. NZTA emergency workers should therefore know the location of protected significant natural or historic sites.

Emergency maintenance works to re-establish state highway links should ensure that natural and historic sites are protected, while providing for the safety of State highway users and emergency workers.

Special attention must also be paid to tidy-up works following reopening of a State highway.

6.12 NZTA Approved On-road Activities on State Highways

When NZTA is considering approving on-road activities (for example, filming) on State highways through Public Conservation Land, NZTA will advise the applicant to discuss their application with DOC so they can obtain any other necessary approvals.

Similarly, if DOC is approving an activity that may affect the operation of the State highway, DOC will advise the applicant to discuss their application with NZTA.

7.0 Road Pavement, Surfacing, Markings and Road Furniture

7.1 Introduction

This section specifies the requirements for pavement design, carriageways, surfacings and traffic aids either on or adjacent to the carriageway.

7.2 Funding of Second Coat Seals

The *Planning and Investment Knowledge Base (PIKB)* does not explicitly exclude second coat seals from being funded as project works. However, it is expected that the allocation of funding is done effectively and efficiently in order to retain value. Therefore, it is not in the interest of the NZTA to hold project funding in excess of 12 months to fund second coat sealing as a project cost. Past experience shows this to be administratively difficult and the funding tends to be forgotten when the works are finally actioned.

The funding source needs to be given proper consideration and resolved and recorded early in the project process. A sensible approach is to consider the scale and timing of second coat seals at the time of project scoping, and certainly by the preliminary design stage. If the project is highly trafficked and will either have an asphaltic concrete surfacing or the second coat seal is likely to be required within 12 months of substantial completion, the cost of the surfacing should be included in the project cost.

If the project is rural and has relatively low traffic volumes, the second coat seal should be provided for within the maintenance allocation. This allocation will generally need to be made allowance for in the following financial year's maintenance funding. Given that maintenance is being funded in three-year blocks, there is a responsibility between Project and Network Managers to ensure that the allocation for the second coat seals for projects has been properly pre-programmed so as not to become an onerous requirement.

This process was agreed between Regional Partnerships and Programmes and Highways and Network Operations in February 2009.

7.3 Pavement Design

Pavement structural design shall be in accordance with the *AUSTROADS Guide to Pavement Technology Part 2: Pavement Structural Design* and *Part 5: Pavement Evaluation and Treatment Design* together with the latest *New Zealand Supplement*.

7.4 Surfacing Technical Requirements

Surfacing should be in accordance with the following guidelines:

1. *Chipsealing in New Zealand 2005* (Transit New Zealand, Road Controlling Authorities, Roading New Zealand) and subsequent amendments and updates.
2. *Chipseal Design*, New Zealand Institute of Highway Technology,
3. *Applying Bitumen Emulsions and Polymer-Modified Binders*, New Zealand Institute of Highway Technology,
4. *Pavement Surfacing Supervisor Chipsealing*, New Zealand Institute of Highway Technology.

7.5 Pavement Markings

The legal requirements for pavement markings are described in the Land Transport Rule: Traffic Control Devices 2004, with its amendments.

Pavement markings shall be in accordance with the following guidelines:

1. Land Transport Rule: Traffic Control Devices 2004, with its amendments.
2. *Traffic Control Devices Manual* and *Manual of Traffic Signs and Markings*, with relevant *Technical Advice Notes*.

7.6 Intersection Controls and Medians

These should conform with the following guidelines:

1. *RTS 1: Guidelines for the Implementation of Traffic Control at Crossroads*, NZTA.
2. *Traffic Control Devices Manual Part 5: Traffic Control Devices for General Use – Between Intersections*, NZTA.
3. *Guidance on Median and Centreline Treatments to Reduce Head-on Casualties*, Austroads (2016).
4. *Austroads Guides*:
 - o *Road Design Part 4A: Signalised and Unsignalised Intersections*, 2021
 - o *Road Design Part 4B: Roundabouts*, 2021
 - o *Guide to Traffic Management Part 10: Transport Control - Types of Devices*, 2020.

7.7 Pedestrian Crossings

The requirements for pedestrian crossings are contained in the Land Transport Rule: Traffic Control Devices 2004. Note that pedestrian crossings shall not be installed on roads where the speed limit is greater than 50 km/h unless approval is obtained from the General Manager, Safety, Health and Environment.

Details of pavement markings are specified in the *Traffic Control Devices Manual* and the *Manual of Traffic Signs and Markings Part II: Markings*, NZTA. No stopping lines may need extensions, via bylaws, for visibility especially where school patrols operate.

Lighting shall be in accordance with AS/NZS 1158.4:2015.

New installations shall be constructed only where they meet the warrant requirements set out in the *Traffic Control Devices Manual* and the *Manual of Traffic Signs and Markings*.

7.8 Safety Barriers and Median Barriers

These should comply with the following guidelines:

AUSTROADS *Guide to Road Design (in particular Part 6)*, M23 *Roadside Safety Barrier Systems* and AASHTO *Roadside Design Guide*.

7.9 Skid Resistance

The management of skid resistance shall be in accordance with the *Specification for State Highway Skid Resistance*, NZTA T10.

8.0 Response to the Civil Aviation Authority Rule Changes for Remote Piloted Vehicle Systems

8.1 Policy

The following two requirements represent the agreed policy for managing the access requests for remotely piloted aircraft systems (drones), namely:

1. That the airspace over any State highways road corridor is unavailable to recreational operators because the level of public risk is unacceptable and there are more appropriate areas available to such operators; and
2. Requests for access to State highway corridors will only be accepted from operators of a remotely piloted aircraft system if they are certified by the Civil Aviation Authority (CAA) in accordance with the Civil Aviation Rules Part 102.

8.2 Other Specific Matters to be Addressed in Any Approval

1. No remotely piloted aircraft system shall be operated over a live traffic lane unless it is delivering State highway services, it is airworthy and it has built-in safety devices that acceptably limit possible impacts on public safety.
2. Operators of remotely piloted aircraft systems requesting access to other NZTA land, especially construction sites, are required to demonstrate that they have suitable training and experience similar to those operators requesting highway access.
3. No operator shall fly a remotely piloted aircraft system over a live work site without the direct agreement of the site crew and their employer and having suitable safety measures in place.
4. Approval of requests for access for operation of remotely piloted aircraft systems to be on a case by case process based on risk assessment and mitigation with a case specific safety mitigation plan for each application.
5. Note that as operators requesting access to highways can be deemed to be working and that working on, over or under State highways requires written approval (s.51 Government Roading Powers Act), it can be held that Civil Aviation Authority approval does not give any operator automatic access to any highway. Requests for access should be tied back to the same process as used for managing Corridor Access Requests including the traffic management plan.

8.3 Explanatory

1. The notification requirements included in the Civil Aviation Rules Part 101 (last two requirements) mean that it would be fairly impracticable to try to fly over a live road under that Rule. Therefore, any operators on roads with traffic would practically need to be certified under Civil Aviation Rules Part 102.
2. Certified operators are required to have a safety management system in place that covers both the operator and the machine. This meets our requirements for safety under live road conditions. Where the road is closed or for other NZTA land, including construction sites, then operation is possible under Rule 101 but a safety plan should be a condition of access.
3. There are operators such as the Police, our contractors and other suppliers who might want to operate over highways that are closed. The expansion of the technology means that a number of new uses have already become apparent, such as photo surveys, inspections and publicity shots for example. It is essential not to close out opportunities the technology enables but balance that with managing the likely risks to the public.

4. All remotely piloted aircraft system operators must abide by all regulations from the International Civil Aviation Organization and the Civil Aviation Rules.
5. Note that long established aero-model clubs operating at well-established sites are excused from the Civil Aviation Rules and therefore from this process. At least two such sites are known: south of Levin and at Matamata airfield, which affect State highways directly. All that is required is to assure that any events at these sites are well managed and controlled.
6. Evaluation of the criteria is set out in the flowchart in Figure 1 below.

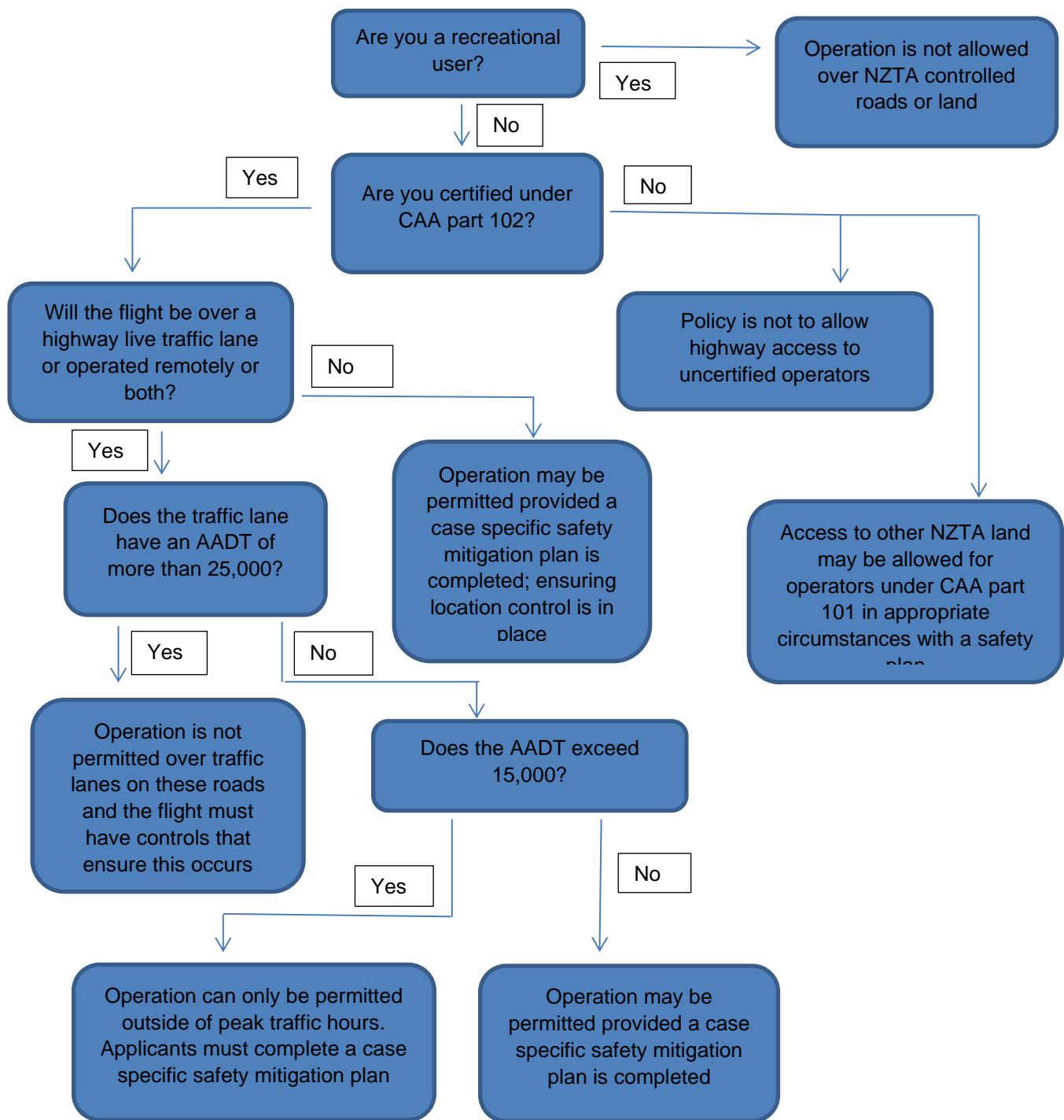
8.4 Criteria for Flying Over High-risk Infrastructure (Under Civil Aviation Rules Part 102)

1. There are two sets of zone controls that affect approvals for operations of RPAS adjacent to airports. Firstly, as part of the international regulations, all of the international airports in New Zealand (Auckland, Rotorua, Wellington, Christchurch, Queenstown and Dunedin) are listed as having Category B protection, which consists of a 0.6 mile (one kilometre) no-fly exclusion zone for RPAS. A number of sections of State highway pass through those exclusion zones and no approvals shall be given within those no-fly areas. Secondly there is a section in the Civil Aviation Rules that applies a controlled flying zone for four kilometres from the boundary of any aerodrome and the Rule requires both certification from the CAA and permission from the operator of the aerodrome to fly a RPAS. There are significant airports that are close to highways, such as State Highway 1 at Ohakea and State highway 21 at Hamilton where the highways pass very close to the end of the airports' main runways.
2. No open approvals shall be given to fly into operational areas frequented by other transport. For example, in central Auckland there are heliports adjacent to sections of the motorway at the port and the hospital. Frequent flightpaths and practical ceilings would need to be mapped. Bridge inspections using RPAS will need to be properly controlled over navigable waterways.
3. No RPAS shall be operated on a State highway in the period from one hour before sunset to one hour after dawn or in any situation where visibility of the RPAS may be compromised (fog, smoke, heavy rain etc.).
4. On any highway with more than 15,000 vehicles per day, no access is to be granted during the traffic peaks. On any highway with more than 25,000 vehicles per day, no access is to be granted over any live traffic lane.
5. All operators must be able to distinguish whether the RPAS is flying above the live traffic lane. If the RPAS is operating remotely but has sophisticated location and viewing capability this may still be achievable adjacent to high volume highways. Where the RPAS is unsophisticated and the operator is too remote from the RPAS, adjacent to a high-volume highway, to ensure separation from the traffic lane can be controlled visually, access should be declined.
6. Regional offices will need to identify other risk areas on their network where the use of RPAS are too high-risk, such as where there are difficult wind conditions, where Transpower mainline power transmission lines cross the highway, near radio or microwave towers that might interfere with control transmission etc.

8.5 Delegation

Approvals for access are to be made by System Managers.

Figure 1: Flowchart for drone flight requests over NZTA controlled highways and other land



Notes:

- All drone (RPAS, UAV) operators must abide by all regulations from the International Civil Aviation Organization and the Civil Aviation Rules
- An on-highway operator must be a Civil Aviation Rules Part 102 certified operator
- The summary of operations under Civil Aviation Rules Part 101 are in the first attachment below and any non-compliance means Part 102 applies
- The outline of an appropriate safety plan are in the second attachment below

8.6 Attachment 1: The Civil Aviation Rules Parts 101 and 102 Operations

The CAA requirements for the operation of RPAS are covered in two parts:

1. Those wanting to use RPAS that can operate within the Civil Aviation Rules, Part 101, do not need to be certificated by the CAA. To do so the operation must comply with the following criteria where operators:
 - o Do not operate an aircraft that is 25 kg or heavier (or one that is 15 - 25 kg unless they are a member of a CAA-approved organisation) and always ensure the aircraft is safe to operate.
 - o Take all practical steps to minimise hazards to people, property and other aircraft.
 - o Fly only in daylight.
 - o Give way to all crewed aircraft.
 - o Must be able to see the aircraft with their own eyes (e.g. not through binoculars, a monitor, or smartphone) to ensure separation from other aircraft (or use an observer to do this in certain cases).
 - o Do not fly their aircraft higher than 120 metres (400 feet) above ground level, unless they have approval from air traffic control.
 - o Ensure they have knowledge of airspace and restrictions that apply in the area where they want to operate.
 - o Do not fly closer than four kilometres from any aerodrome that is listed in the Aeronautical Information Publication.
 - o Obtain air traffic control clearance from Airways Corporation NZ before flying in controlled airspace.
 - o Do not fly in special use airspace without the permission of the controlling authority of the area (e.g. military operating areas, low flying zones or restricted areas).
 - o Have consent from anyone they want to fly over.
 - o Have consent of the property owner or person in charge of the area they want to fly above.
2. Some exceptions may apply, but generally if an operator cannot meet any of these requirements; the operation needs to go through a full certification process to be approved by the CAA under Part 102 of their Rules.

8.7 Attachment 2: Safety Plan

1. Some initial thinking has been given to an outline of a possible safety plan for regional office guidance. The plan should cover the suitability of the vehicle (airworthiness), including the fail safes built into it if the vehicle is to be operated over live lanes. The plan should cover the suitability of the operator, including experience and training. The plan should cover the measures to be taken to limit the exposure of the public to the risks of the proposed operation including that it should consider how to limit possible driver distraction as a result of the operation. The plan should identify any specific risks in the proposed flight area such as transmission or other lines, significantly large trees, tall buildings, wind effects etc., and how their impacts on the proposed operation will be mitigated.
2. As a result, Regional teams will also need to consider the limitations that might need to be applied to their networks over and above the policy outline when giving approvals. This should be from as simple as ground obstructions (wires, transmission lines, structures etc.) to issues such as areas with wind intensification or sheer (gullies, gorges etc.).

Included in such considerations is to plot out any no-fly zones or special areas that may apply to their networks. More information about these can be found on the CAA website.

9.0 Policy – Flying of Flags on Auckland Harbour Bridge

9.1 Purpose

To specify the flags that are permitted to be flown on the Auckland Harbour Bridge and clarify the direction Waka Kotahi takes to make changes to the current permissions or allow new flags.

9.2 Context

The Auckland Harbour Bridge opened on 30 May 1959. It has an iconic status not only for Auckland, but for New Zealand generally. The bridge is a motorway forming part of State Highway 1, and Waka Kotahi as the Road Controlling Authority (RCA), is responsible for its operation and maintenance.

Various flags have been permitted to be flown from Auckland Harbour Bridge either temporarily (e.g. the alternative New Zealand flag was flown for two months in 2016 in the lead up to the flag referendum), or on a permanent basis (e.g. the Australian flag is flown annually on 25 April for ANZAC day).

Decision making responsibility for flying of flags from Auckland Harbour Bridge has been held by the Minister of Transport, with this responsibility delegated by the Minister to Waka Kotahi (and its predecessor Transit New Zealand) at various points in time.

The flying of flags (including on the Auckland Harbour Bridge) can be controversial, and in some situations, may involve polarized views that cannot easily be reconciled. As such, flags that are currently permitted to fly on the Auckland Harbour Bridge represent matters of national significance and observe occasions of national importance.

A decision about whether a flag is appropriate to be flown from the bridge is not one that neither rests with Waka Kotahi as the RCA, that is under its legislated responsibility for operating and maintaining the bridge, nor in its wider agency role, that is under its objective to contribute to an effective, efficient and safe land transport system. That decision, which involves considerations and implications that extend beyond the transport system. Waka Kotahi therefore relies on established directions from Government, either through legislation or ministerial decisions, as to whether it may be appropriate for a flag to fly from the Auckland Harbour Bridge on any given date.

Waka Kotahi's decision-making responsibility, in its role as a RCA, is centred on whether the flying of flags can be managed from an operational perspective and ensuring that this does not present any risks to safety.

9.3 Scope

This policy only applies to flying of flags on the Auckland Harbour Bridge and not to any other infrastructure owned, managed or maintained by Waka Kotahi.

9.4 Policy Statement

9.4.1 Permitted flags and when they may be flown

The following flags are permitted to be flown from the Auckland Harbour Bridge on the dates, occasions or frequency specified:

Table 2: Flags Permitted to be Flown on the Auckland Harbour Bridge

Permitted flag	Date/ Occasion / Frequency	Relevant legislation or Government decision	Authorised by
New Zealand Flag	Every day of the year (including half-masting occasions as required)	Flags, Emblems and Names Protection Act 1981	His Excellency the Governor-General Administered by Ministry for Culture and Heritage and Ministry of Justice
Māori (Tino Rangatiratanga) Flag	6 February (Waitangi Day)	On 14 December 2009, Cabinet recognised the Māori (Tino Rangatiratanga) flag as the preferred national Māori flag	Minister of Māori Affairs and the Prime Minister
The New Zealand Red Ensign	3 September (Merchant Navy Day)	Flags, Emblems and Names Protection Act 1981	His Excellency the Governor-General on joint recommendation of Ministers for Arts, Culture and Heritage and for Transport
New Zealand White Ensign	1 October (Anniversary of Royal New Zealand Navy's founding)	Flags, Emblems and Names Protection Act 1981	His Excellency the Governor-General on joint recommendation of Ministers for Arts, Culture and Heritage and for Transport
Australian Flag	25 April (ANZAC Day)	Flags, Emblems and Names Protection Act 1981	His Excellency the Governor-General on joint recommendation of Ministers of Defence and of Transport

9.5 Changes to Flags to be Flown

On written notification from Ministers, Waka Kotahi will make changes to the currently approved flags and dates and/or facilitate additional flags and dates that can be flown from Auckland Harbour Bridge. Waka Kotahi simply manages the operational processes relating to raising and lowering approved flags on the relevant dates as specified in the table above.

Waka Kotahi does not receive requests from the public for changes to the currently permitted flags and dates or any additional flags.

9.6 Related Information

The Ministry of Culture and Heritage's website (<https://mch.govt.nz/nz-identity-heritage/flags>) provides guidance and outlines requirements regarding how flags can or should be flown and displayed.

10.0 Dealing with Customer Complaints About Vibration in Operational Situations

10.1 About this Process

The following sections sets out the New Zealand Transport Agency's (NZTA's) process for dealing with the vibration complaints received from the public. The effects which are addressed by this process are:

- nuisance to people
- damage to structures
- traffic induced vibration
- acoustical disturbance from wall vibration (resonance).

10.2 Status of this Process

This is a trial process that will be reassessed for wider application once experience has been gained as to its effectiveness, and cost implications.

10.3 Application of this Process

This process will need to be applied when vibration affects:

- buildings occupied by humans
- historic heritage buildings

All actions arising from this policy:

- are subject to funding availability
- will need to meet all programming requirements for such works to be included in annual maintenance plans.

It must be noted that nothing in this process supersedes the requirements in the NZTA's *Risk Management Manual*.

10.4 Basis of this Process

The actions in this policy are based on the following:

- that the NZTA's remedial action shall be confined to work on its own infrastructure
- that the NZTA has obtained legal advice that, as a highways agency, it is unlikely that the NZTA would be held to be liable for any damage occurring as a result of traffic-induced vibration, but each case would need to be determined on its own facts.

If, notwithstanding the above, it is considered that there may be reasons to carry out repairs on on-NZTA property, the NZTA shall:

- refer the case to the Chief Executive for consideration of further action
- keep our insurance and risk management advisers informed of our intentions.

10.5 How to Deal with Vibration Related Complaints

This process is designed to ensure that all complaints from the public are treated irrespective of whether they allege damage or are nuisance related only. Therefore, the steps below are for both damage allegations and nuisance complaints.

Follow the steps below when a complaint is received about vibration effects adjacent to a State highway:

Step	Action
1	Carry out the procedure under <i>Claims Handling –Initial Steps</i> in the section on <i>Management of Third Party Claims</i> in NZTA's <i>Risk Management Manual: Insurance</i> .
2	Investigate the damage or nuisance complaint.
3	Arrange to inspect the site with the complainant.
4	Attempt to establish the cause of the vibration.
5	Attempt to establish who is responsible for any alleged damage.
6	Estimate the cost of repairing any alleged damage both on and off NZTA property.

Step	Action
7	<p>IF the complaint . . .</p> <p>THEN . . .</p>
	<p>(a)could lead to claims being made against NZTA</p> <ul style="list-style-type: none"> out the procedure under <i>Notification of Claims</i> in the section on <i>Management of Third-Party Claims</i> in NZTA's <i>Risk carry Management Manual: Insurance</i>. *
	<p>(b) is unlikely to lead to claims being made against NZTA</p> <ul style="list-style-type: none"> go to step 8.
8	<p>(a)It can be established that a NZTA contractor, a NZTA consultant, or a third party is responsible for any alleged vibration damage</p> <ul style="list-style-type: none"> refer the complaint to the relevant entity advise the complainant monitor progress carry out the procedure How to conclude NZTA's action, 10.11
	<p>(b)The estimated cost to NZTA of repairing any alleged vibration damage is greater than NZTA's deductible</p> <ul style="list-style-type: none"> seek NZTA's insurance and risk management advisers' guidance before proceeding to step 9 (NZTA's deductible is \$10,000 for both its public liability and personal indemnity insurance)
	<p>(c)NZTA's insurance and risk management advisers recommend that NZTA handle the complaint internally</p> <ul style="list-style-type: none"> refer to the section <i>Handling Claims Internally</i> in NZTA's <i>Risk Management Manual: Insurance</i>
	<p>(d)None of the above apply</p> <ul style="list-style-type: none"> go to step 9
9	Carry out the procedure How to decide the next course of action, 10.6 .

10.6 How to Decide the Next Course of Action

Follow the steps below if the NZTA's insurance and risk management advisers recommend that a vibration related complaint is handled internally:

Step	Action		
1	IF . . .		THEN . . .
	(a)there is an obvious road surface deficiency		go to step 2
	(b)there is no obvious road surface deficiency		go to step 3
2	If there is an obvious road surface deficiency* that would be . . .	AND the proposed remedial work . . .	THEN . . .
	(a)low cost to correct	Meets the appropriate funding criteria	<ul style="list-style-type: none"> correct the deficiency carry out the procedure How to conclude NZTA's action 10.11
	(b)low cost to correct	Does not meet the appropriate funding criteria	<ul style="list-style-type: none"> go to step 4
	(c)expensive to correct	N/A	<ul style="list-style-type: none"> go to step 5
3	IF there is no obvious road surface deficiency AND on inspecting the site with the complainant . . .		THEN . . .
	(a)the vibrations are barely perceptible AND no damage has been alleged		<ul style="list-style-type: none"> go to step 4
	(b)vibrations are easily perceptible, or the complainant alleges damage		<ul style="list-style-type: none"> go to step 5

*A road surface deficiency may be:

Example:

- a dig out repair that does not meet NZTA's normal service level requirements or a bump at a bridge abutment that does not meet NZTA's normal service level requirements.

Step	Action	(a) THEN	(b) ELSE
4	If the complaint alleges that . . .		
	Traffic induced vibration has become a problem since NZTA carried out a modification to the adjacent State highway AND NZTA agrees that the vibration problem may be linked to the modification	<ul style="list-style-type: none"> • NZTA is obliged to be more responsive in this situation than if it had not modified the State highway. Hence every effort should be made to suggest a possible solution** • If no solution can be suggested then carry out the procedure How to conclude NZTA's action, 10.11 	Carry out the procedure How to conclude NZTA's action, 10.11
5	Traffic induced vibration has become a problem since NZTA carried out a modification to the adjacent state highway AND NZTA agrees that the vibration problem may be linked to the modification	<ul style="list-style-type: none"> • NZTA is obliged to be more responsive in this situation than if it had not modified the State highway. Hence every effort should be made to suggest a possible solution** even if measured vibrations turn out to be less than the nuisance level threshold. • Measure the vibration (see How to deal with vibration measurement, 10.7) 	Measure the vibration (see How to deal with vibration measurement, 10.7).

** an example of a solution might be to suggest that a speed camera be installed if nuisance-level vibrations are only caused when vehicles exceed the speed limit.

10.7 How to Deal with Vibration Measurements

Follow the steps below to undertake vibration measurements:

Step	Action
1	<p>Make arrangements for a vibration trial. That is:</p> <ul style="list-style-type: none"> • Commission a suitably qualified person to undertake the measurements (the Institute of Geological and Nuclear Sciences Ltd, Gracefield Research Centre, Lower Hutt, is a good starting point) • Arrange a suitable time for the trial in consultation with the complainant • Arrange for a test vehicle to be available to generate the vibrations (the type of vehicle can be chosen by the complainant, but it must be a type of vehicle which typically uses that particular section of State highway, and be legally loaded) • Set up any traffic management requirements for the trial and discuss the plans with the police if necessary.
2	Discuss with the person undertaking the measurements what parameters need to be measured and how the recorded information will be used (see How to interpret vibration measurements, 10.8).

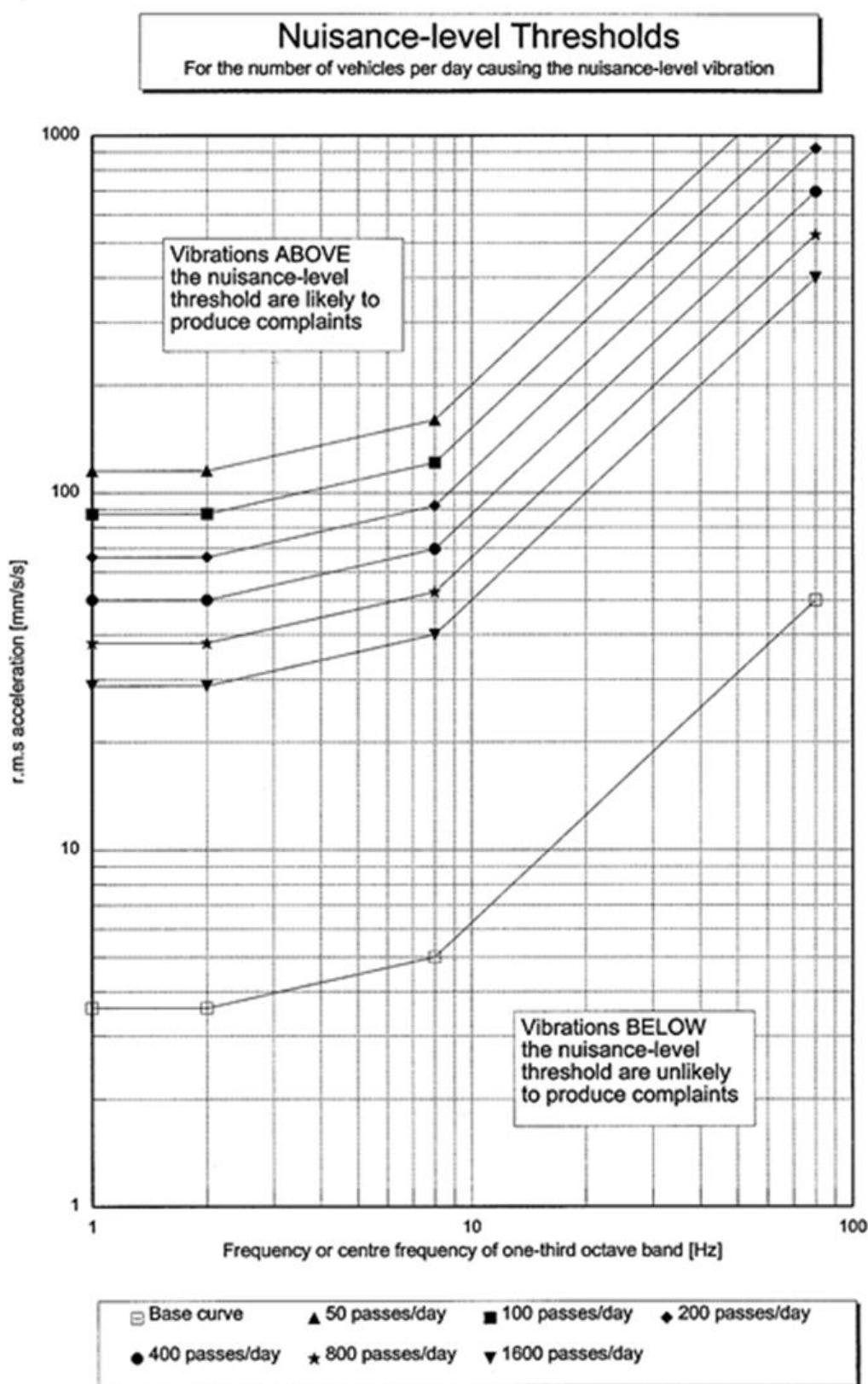
3	For the trial, set up the measuring apparatus on a stable surface outdoors (e.g. on a concrete path or driveway), and not closer to the source of the vibration than the nearest part of the building where the complainant claims the vibration is being felt.
4	The person undertaking the measurements should record the vibration trace, as he or she sees fit, as the test vehicle passes the site at a steady known speed (see notes 1 and 2 below).
5	Conduct a range of tests to determine the worst-case scenario. For example: <ul style="list-style-type: none"> Tests at different speeds (see notes 1 and 2 below). Tests with the test vehicle being driven in different lanes, if the particular section of State highway is multi-lane. Combinations of the above as necessary.
6	Decide what is the worst-case scenario and repeat that test to confirm the first result (within $\pm 20\%$ is acceptable).
7	Sometime after the trial, carry out the procedure How to interpret vibration measurements, 10.8 .
Note 1	While it is useful for a vibration trial to determine whether the level of vibration is speed related, only vibrations that are generated by a vehicle travelling within the legal speed limit shall be used for determining whether remedial action should be undertaken.
Note 2	If any tests are to be carried out with the test vehicle exceeding the speed limit, then permission for this must be obtained from the police.

10.8 How to Interpret Vibration Measurements

Step	Action
1	Request hard copies of the following results for each test from the person who undertook the measurements: <ul style="list-style-type: none"> acceleration time history plots and maximum and minimum accelerations in the three Cartesian coordinates, i.e. <ul style="list-style-type: none"> vertical accelerations (in the z axis direction) accelerations in the x-y plane, perpendicular to the road accelerations in the x-y plane, parallel with the road plots of the Fourier amplitude spectrum of vertical acceleration (graphs of spectral amplitude versus frequency)
2	If necessary, request assistance from the person who undertook the measurements or the Senior Manager Maintenance and Operations at NZTA Wellington Office for steps 3 to 6 below.
3	For the worst-case test, in terms of peak acceleration, identify from the Fourier amplitude spectrum of vertical acceleration, predominant frequency (the highest peak).
4	Convert the largest absolute peak acceleration, for the worst-case test to an r.m.s. acceleration by dividing it by $\sqrt{2}$
5	Plot the "frequency" from step 3 versus the "r.m.s. acceleration" from step 4 on the graph of Nuisance-level thresholds, Figure 2 .

6	IF the point plotted in step 5	THEN the nuisance-level threshold has . . .
	...	
	(a) Is <i>below</i> the curve corresponding to the number of passes per day of the vehicle type causing the vibration	<ul style="list-style-type: none"> Not been exceeded Carry out the procedure How to determine whether resonance is a problem, 10.9.
	(b) Is <i>above</i> the curve corresponding to the number of passes per day of the vehicle type causing the vibration	<ul style="list-style-type: none"> Been exceeded Carry out the procedure How to decide on appropriate remedial action, 10.10.
	<p><i>Example:</i> peak acceleration = 70 mm/s²</p> <p>r.m.s. acceleration = $70 \div \sqrt{2} = 50 \text{ mm/s}^2$</p> <p>dominant frequency = 9 Hz</p> <p>passes/day of vehicle type = 800 passes per day</p> <p>conclusion = threshold not exceeded</p>	

Figure 2: Nuisance-Level Thresholds



Source: ISO 2631-2 : 1989 (E) *Evaluation of human exposure to whole-body vibration.*

10.9 How to Determine Whether Resonance is a Problem

Follow the steps below to determine whether undesired acoustical disturbances (resonance) is a problem:

Step	Action	AND undesired acoustical disturbances...	THEN the criteria for determining whether resonance is a problem...
1	a. Greater than 30 Hertz	Have been observed	<ul style="list-style-type: none"> • Have been met • Carry out the procedure How to decide on appropriate remedial action, 10.10
	b. Greater than 30 Hertz	Have not been observed	<ul style="list-style-type: none"> • Have not been met • Carry out the procedure How to conclude NZTA's action, 10.11
	c. Less than 30 Hertz	N/A	<ul style="list-style-type: none"> • Have not been met • Carry out the procedure How to conclude NZTA's action, 10.11

10.10 How to Decide on an Appropriate Remedial Action

If the policy has determined that the NZTA should investigate remedial action to reduce vibration levels, then follow the steps below to decide on appropriate remedial action:

Step	Action		
1	IF pavement smoothing or rehabilitation...	AND the System Manager ...	THEN, after obtaining the complainant's agreement...
	(a)Would reduce vibrations AND meets the appropriate funding criteria	Thinks it is appropriate to proceed	Carry out pavement smoothing or rehabilitation Carry out the procedure How to conclude NZTA's action, 10.11 .
		Does not think it appropriate to proceed	go to step 2
	(b)Does not meet the appropriate finding criteria	N/A	go to step 2
	(c)Would not reduce vibrations	N/A	go to step 2
2	Investigate other remedial actions		
3	(a)A solution which NZTA could undertake, which would reduce vibrations, that has a fundable benefit cost ratio	Thinks it is appropriate to proceed	Request funding and include the solution in the work programme Carry out the procedure How to conclude NZTA's action, 10.11 .

		Does not think it appropriate to proceed	Carry out the procedure How to conclude NZTA's action, 10.11.
	(b) Either no solution or no solution with a fundable benefit cost ratio	N/A	Carry out the procedure How to conclude NZTA's action, 10.11.

10.11 How to Conclude NZTA's Action

If the policy has determined that the NZTA should investigate remedial action to reduce vibration levels, then follow the steps below to decide on appropriate remedial action:

Step	Action	
1	IF the complaint that initiated this process ...	THEN
	(a) Has been satisfactorily dealt with	<ul style="list-style-type: none"> Report to the Senior Manager Maintenance and Operations on the outcome of any claims Report to NZTA's insurance and risk management advisers on the outcome of any claim Complete the claims register
(b) Has not been satisfactorily dealt with		<ul style="list-style-type: none"> Refer the case to the National Manager Maintenance and Operations for consideration of further action
2	Report back to the complainant.	

11.0 Schedules held for Miscellaneous Group Activities

11.1 Purpose

System Managers and the Portfolio Manager, Delivery Portfolio, regional Managers and Programme Directors from Infrastructure Delivery are required to maintain schedules and registers of various consents given for works on State highways or other activities approved under delegation.

11.2 Schedules to be Maintained by System Managers

The table below shows the schedules required to be maintained by System Managers but not required to be presented to Group meetings:

No	Name of Schedule	Activity approved by	Comment
1	Traffic restrictions approved under delegation.	SM,PA	Road closures, bus stops, parking restrictions etc.
2	Special vehicle lanes approved under delegation.	SM,PA	Clearways, bus lanes, HOV lanes etc.
3	Consent for works on State highways approved under delegation.	SM,PA	Service crossings, installations etc.

12.0 Safety Improvements, Monitoring and Reporting Requirements, Crash Prevention and Safety Audits

12.1 Introduction

The NZTA has adopted as its policy for improving safety on State highways, the implementation of traffic safety measures to reduce the overall number and severity of crashes by the application of low cost engineering works and also the application of safety principles to improvement and maintenance works.

12.2 Crash reduction studies

At least annually, the Managers, System Management shall review the accident situation on their roading network. This will be achieved by means of a regional Safety Management Strategy (SMS) and will involve collecting data, identifying accident situations and deciding on accident study programmes.

As a specific measure for implementing the safety improvement policy, crash reduction studies (CRSs) shall be carried out on the State highway system on a five-yearly cycle. Identified black spots are to be investigated annually.

12.3 Guidelines for Crash Prevention and Safety Audits

This section provides the references for guidance on crash reduction and prevention. References for reducing the incidence of crashes are as follows.

12.3.1 Policy Guidance

Safety Audit:

[Road safety audit procedures for projects](#) (Transport Agency May 2013).

Crash Reduction:

Transit/MOT (now NZTA) Policy Guidelines for Traffic Accident Reduction and Prevention 1990.

12.3.2 Procedures

Safety Audit: See section above.

Crash Reduction:

Transit/MOT Accident Investigation Procedures 1991.

Guidance on crash reduction studies is available in (Austroads) Guide to Engineering Practice Part 4: Treatment of Crash Locations.

12.3.3 Monitoring

Monitoring of safety audits is not a requirement but System Managers should ensure that all recommendations are responded to and approved actions completed.

12.4 Implementation of improvements

Crash reduction study reports are to be forwarded to the NZTA offices promptly and approved safety projects are to be incorporated in the work programmes as soon as current NZTA guidelines permit. The following are general guides:

Land transport programme for State highways:

- Minor safety works should be implemented within 12 months.

- Major safety projects should be programmed in accordance with the requirements of the NZTA's PIKB.

12.5 Annual Monitoring

Annual monitoring reports are to be carried out on completed safety projects, resulting from crash reduction studies, for a period of five years. Monitoring reports are to be forwarded to the Design Portfolio Manager.

12.6 Traffic Accident Investigation Commission

At the discretion of the Chief Commissioner, the Traffic Accident Investigation Commission (TAIC) may decide to conduct an investigation into road crashes. The NZTA will, upon request, provide any information it holds which is relevant to the investigation.

The TAIC will provide the NZTA with a copy of its draft report prior to circulation to interested parties.

All of the NZTA's communications with the TAIC are to be authorised by the Chief Executive.

13.0 Emergency Prohibition of Heavy Motor Vehicles

National Manager Maintenance and Operations or National Manager System Design (for new works) are authorised on reasonable grounds to prohibit heavy motor vehicles from using State highways in terms or regulation 10(3) of the HMV Regulation 1974 for any specified period or series of periods.

National Manager Maintenance and Operations or Portfolio Manager (for new works) are authorised on reasonable grounds to prohibit heavy motor vehicles from using State highways in terms or regulation 10(4) of the HMV Regulation 1974 as required to protect the road from excessive damage for extended periods of up to 12 months for vehicles of a specified axle weight. This can be extended for further periods as required.

This power must be used sparingly and only to prevent extraordinary damage to the highway, as a result of an emergency resulting from climatic conditions or other unusual circumstances, as referred to in regulation 10(5) of the HMV Regulations 1974.

All cases where this regulation is invoked are to be reported to the Board for information.

14.0 Weight Enforcement Facilities

14.1 Introduction

Weight enforcement facilities are provided by the NZTA for use by NZ Police in their enforcement of legal weight limits and regulations on road user charges.

14.2 Policy

NZTA supports a programme of effective heavy motor vehicle enforcement leading to a reduction in the level of road user charge offending and overloading. For this reason, the NZTA constructs and maintains a number of weight enforcement facilities and associated equipment for use by the NZ Police. The NZTA has a strategy for the development of weight enforcement.

14.3 The Strategy

The strategy for weight enforcement which has been agreed between NZ Police and the NZTA is for:

- (a) New weighbridges at strategic and feasible locations on the heavy vehicle routes identified in the Weigh/Right policy
- (b) Adapting existing weighpits to take new portable scales or conversion to roadside weighing areas
- (c) Forming roadside areas for random weighing using portable scales on lesser trafficked rural highways
- (d) Further purchase of new portable scales
- (e) Support for private information weighing facilities at areas such as service stations and truckstops
- (f) Continued use of private weighbridges where practical
- (g) Support for private weighing facilities at container ports

14.4 NZ Police Resources

The enforcement of heavy vehicle regulations including weight and dimension limits, road user charges, safety, and driving hours is performed by a specialist resource within NZ Police known as the Commercial Vehicle Investigation Unit (CVIU). There are five units attached to the NZ Police regions.

The activities of the CVIU are covered by an annual plan known as the Road Safety Programme (RSP) which provides funds from the National Road Fund for heavy vehicle enforcement and Road User Charges compliance and includes performance targets. NZ Police provide reports against these performance targets.

14.5 Responsibility Split with NZ Police

The RSP funds the human resources for operation of weighing facilities. This programme also funds electricity, telephone, water, and other consumables and operating expenses. NZ Police may also supply their officers with portable equipment such as laptop computers that may be required for their duties.

The NZTA has agreed to fund the following items:

- construction and upgrading of weighing facilities
- maintenance and calibration of the weighing equipment and sites including weighbridge electronics but excluding portable scales
- maintenance of building exteriors, surrounds, and sites

- provision of secure accommodation required for police officers rostered at weighbridges including toilet facilities, water supply, car parking, lighting and other items necessary for the operation of the weighing facility

These items are funded from the National Land Transport Programme.

14.6 Equipment Calibration

Section 197 of the Transport Act 1962 stipulates the requirements for weighing equipment and sites to be tested or surveyed. For weighbridges this activity is coordinated by NZ Police. NZ Police also arrange their own calibration for their portable scales.

14.7 Routine Maintenance

NZTA's System Managers are responsible for the routine maintenance of all weighbridge equipment, sites, and building exteriors via the network maintenance contracts.

14.8 Requests for Funding

Funding for maintenance is provided by the NZTA through the State highway maintenance activity class in accordance with the Work Category 123 definition in the *Planning and Investment Knowledge Base*.

Funding for new weight enforcement facilities and improvement to existing facilities is to be sought in accordance with the process in Table 3 below through the road improvements activity class Work Category 321: New traffic management facilities in the *Planning and Investment Knowledge Base*.

Table 3: Maintenance Plan Process for New Weight Enforcement Facilities and Improvements to Existing Facilities

Proposed Process for Development of a Maintenance Plan for Heavy Vehicle Enforcement on State Highways

Action	Date due by
1. Preliminary funding provision made in draft state highway programme. [NZTA Wellington and Regional actions]	1 November
2. Regional liaison meetings between NZTA and CVIU.	15 December
3. Programme forwarded to Practice Lead – Project Management (ID), NZTA Wellington.	31 January
4. NZTA/Police liaison group at national level, convenes to prioritise regional programme requests.	15 February
5. ID submits agreed programme to Senior Manager Portfolio and Programmes Office, for inclusion in final State Highway Programme.	28 February
6. Programme included in draft NLTP programme for approval	30 June
7. NZTA regions and CVIU at national level advised of approved programme when Minister approves.	15 August
8. NZTA regions advise local CVIU staff of approval and regional implementation plan.	1 September

- **Notes**
 - Funding requests are to be in accordance with the NZTA *Planning and Investment Knowledge Base (PIKB)* in the 3 following categories:
- **Maintenance**
 - Normal care and attention of existing site and facilities, including pavement repairs and sealing. *[Work to be included in regional annual plans/programmes]*
- **Improvements**
 - Low cost/low risk work that improves the level of service of the weigh site. May include access improvements such as additional lanes and tapers, visibility improvements, lighting and new concrete surfaces. Supporting reasons for the work and how it aligns with the current Weigh/Right strategy are required. *[Work to be prioritised for inclusion in the national low cost/low risk works programme allocation]*
- **New Major Sites**
 - Works to be processed as capital works, including formal justification, BCR and reference to its alignment with current heavy vehicle enforcement strategy. *[Work to be included in regional capital programme]*.