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Conducting On-road Trials of New & Innovative Treatments – Guideline

Policy & Programs

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Conducting On-road Trials of New & Innovative Treatments – Guideline



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| Guideline Statement |
| This guideline provides the framework for conducting on-road trials of new and innovative road and roadside treatments, products and devices. |

1. Purpose

Proposals for the introduction of new and innovative treatments, products and devices onto the Victorian road network are regularly received by VicRoads. These may be unsolicited or come about in response to a problem for which a satisfactory solution is not readily available or current approaches are less efficient. As part of the assessment process, it is often necessary to trial a treatment, product or device on the road network in order to gather evidence of its in-service performance. A transparent and planned approach across the organisation is required.

This guideline outlines VicRoads’ practices and requirements for conducting on-road trials of new and innovative treatments, products and devices.

1. Definitions

The definitions and abbreviations in the following table apply to this guideline.

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| Term | Meaning |
| Treatment | Road and roadside infrastructure or infrastructure components, including physical products and devices, which are used to guide, inform, control, regulate, manage or otherwise provide for vehicular traffic and / or other road users. |
| Trial | A formal, structured process to assess the in-service performance of a treatment, usually by the limited application of the treatment on the road network for a specified period of time with an evaluation of performance based on prescribed criteria.  |
| BMF | VicRoads’ Benefit management Framework |
| IEF | VicRoads’ Investment Evaluation Framework |
| ITS | Intelligent transport systems |

1. Scope

This guideline applies to treatments that:

* Have not previously been used on the Victorian road network and there are no existing guidelines, standards or specifications that are relevant to their use in Victoria, or
* May be similar to treatments that have been used or approved for use on the Victorian road network but they have specific characteristics that are different or it is proposed that they be used in a fundamentally different manner.

The guideline should be used for on-road trials (subject to exceptions outlined in Section 7) that:

* Are managed by or on behalf of VicRoads, or
* Are conducted on any road for which VicRoads is responsible, or
* Are expected to have an outcome that impacts on VicRoads’ responsibilities (such as changes to standards, guidelines, specifications or road rules).
1. Guideline Principles

The following principles have been developed to support decision making regarding on-road trials of new and innovative treatments:

*Guideline Principle 1*: Ensure that any proposed new or innovative treatment is a viable option that addresses an identified problem or offers a new opportunity.

*Guidelines Principle 2*: Minimise, as far as practicable, all safety, legal, reputational and financial risks associated with the on-road trial.

*Guidelines Principle 3*: Ensure that the on-road trial will enable the benefits and disbenefits of a new or innovative treatment to be evaluated.

*Guidelines Principle 4*: Identify and engage key internal and external stakeholders to ensure that the on-road trial is conducted in a robust and efficient manner.

*Guidelines Principle 5*: If there are unacceptable safety, operational or other adverse impacts during a trial, or the trial is unsuccessful, trial sites must be reinstated to their original, or acceptable, condition as soon as practicable.

*Guideline Principle 6*: The outcome of the trial is to be communicated to all key stakeholders.

1. Responsibilities

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| Role | Responsibility |
| Manager Network Standards | Review, disseminate and monitor this Guideline |
| Monitor the register of on-road trials of new and innovative treatments and ensure that it is easily accessible |
| Business Area Managers | Apply the guideline when conducting on-road trials of new and innovative treatments |
| Approve trial plans |
| Update the register of on-road trials of new and innovative treatments for trials for which they are responsible |

1. Guidelines

The guidance outlined in this section is based on the guideline principles (Section 4). It provides what is considered to be a best practice framework for conducting on-road trials of new and innovative treatments. The practices and requirements should be applied wherever practicable. Variations from these guidelines can be made provided they are consistent with the guidelines principles.

Consideration of the use of a new or innovative treatment will usually arise for one of following reasons:

* VicRoads has identified a problem which cannot be solved to the extent desired by the application of a treatment (or combination of treatments) which has been adopted previously or is currently approved for use on Victoria’s road network.
* A new opportunity had arisen (e.g. new technology which may reduce the whole-of-life cost of a traffic management function).
* An unsolicited proposal has been received from industry relating to a treatment that hasn’t previously been accepted or approved for use on Victoria’s road network.

Regardless of the origin of the treatment, VicRoads will only adopt a new or innovative treatment if it has the potential to provide tangible benefits. An on-road or in-service trial will often be necessary to assess whether a treatment delivers satisfactory outcomes and does not have adverse impacts that are unacceptable or cannot be mitigated.

The process diagram in Attachment A illustrates the generic steps for a new or innovative treatment from inception to approval for general use on the road network.

VicRoads has adopted an Investment Evaluation Framework (IEF)[[1]](#footnote-1) which strengthens its capacity to effectively measure the achievements of benefits, capture learnings and use these to inform decision making. The IEF details the approach to post completion evaluation to be used across VicRoads and supports the learn stage of the plan / deliver / learn investment cycle.

Not all on-road trials would be subject to the detailed evaluation processes of the IEF. The scale and complexity of evaluations should be commensurate with the treatment that is being evaluated, the objectives of the trial and the subsequent decisions / actions that are expected, based on the trial outcomes. The IEF and VicRoads’ Benefit Management Framework (BMF) provide valuable information and guidance for defining problems, determining appropriate performance indicators and measures, and undertaking evaluations.

Accepting a Treatment for Trial

Prior to the commencement of a trial on the road network it will be necessary to undertake an assessment of a new or innovative treatment to determine if it is appropriate to proceed. The process is dependent upon the particular type of treatment. This Guideline provides information on the typical steps that precede an on-road trial. It does not provide detailed guidance on VicRoads’ requirements and responsibilities during this phase.

VicRoads’ procedures for consideration of some classes of treatments are well defined and understood, but for others the process is ad hoc. For infrastructure treatments the process is well established, with project approval though the Project Review Committee (PRC) or Regional Review Committee (RRC) at the corporate or regional level respectively, as appropriate. Attachments B, C and D summarise the existing and emerging processes for ITS, safety barrier and road pavement / construction products respectively.

The assessment process prior to the commencement of an on-road trial typically includes the following steps:

* **Identification of the problem or opportunity:** What is the problem to be solved or the opportunity that justifies consideration of the treatment?
* **Identification of options:** Optional treatments should be considered prior to progressing to an on-road trail. What options exist to address the problem? If a specific treatment, which presents an opportunity, has been proposed, are there alternative treatments that may produce a similar outcome?
* **Analysis of options:** Analysis should be based on whole-of-life costs, benefits (using relevant performance indicators), disbenefits and associated risks of the treatment options. The results will determine if one or more options are likely to be acceptable. The urgency to address the defined problem may also be a consideration when deciding whether an on-road trial should proceed.
* **Preferred option(s):** The analysis will identify which option or options have the greatest potential to effectively produce benefits and best fit the treatment acceptance / type approval criteria.
* **Acceptance for trial:** Acceptance of a treatment option(s) to proceed to the on-road trial phase (where required) should be in accordance with the process established for the particular type of treatment. Formal approval may be required at this point. Whether a trial is to be fully or partially funded by an external agency should be considered.

Related Guidelines Principles

* Ensure that any proposed new or innovative treatment is a viable option that addresses an identified problem or offers a new opportunity.

Planning the On-road Trial

The objective of an on-road trial is to assess how a treatment performs in a real life setting. Planning for the trial and how it is to be evaluated is a critical activity. The establishment of clear and relevant performance indicators and associated measures that are linked to the benefits[[2]](#footnote-2) that the treatment is expected to produce is necessary to guide the design of the trial, determine data requirements and to ensure that an appropriate evaluation methodology is used. This will have bearing on the timing of the trial, particularly if there is a need to collect baseline data prior to the implementation of any changes to road or roadside infrastructure.

Performance indicators may include or be related to casualty crashes, vehicle speeds, travel times, queue lengths, traffic volume, road user behaviour, environmental impacts, sustainability, treatment durability and compatibility with existing systems. Objective measures should be used as much as possible.

Related Guidelines Principles

* Ensure that the on-road trial will enable the benefits and impacts of a new or innovative treatment to be evaluated.

Designing the Trial and Evaluation Methodology

A trial proposal and evaluation methodology that is based around the defined performance indicators and measures will ensure that evaluation of the in-service performance of the treatment is robust. The number and location of trial sites should be selected so that data samples are sufficient, or the trial staged in a way that allows a reliable evaluation to be conducted. As far as is practicable, the trial sites should be representative of the locations at which the treatment is ultimately likely to be used if adopted for general use on the road network. Trial sites may include local roads with the agreement of the relevant council(s).

The method of evaluation will depend upon the performance indicators and measures, and whether they are quantitative or qualitative. Further information about how to conduct an evaluation and who should do it, which may be of assistance, can be found in the IEF.

The trial plan (see below) should detail the key steps during the trial and its evaluation, with timelines. This includes the duration of the trial phase and whether pre-trial conditions are to be reinstated on completion of the trial.

Related Guidelines Principles

* Ensure that the on-road trial will enable the benefits and impacts of a new or innovative treatment to be evaluated.

The Trial Plan

A trial plan is to be prepared which typically documents the following:

* The target problem or opportunity
* The objectives of the trial
* Performance indicators and measures
* The design of the trial (including location details)
* How the trial is to be evaluated and by whom
* Trial costs and funding sources
* Timelines
* Assessment of risks
* Stakeholder engagement

A detailed cost estimate for the trial is to be prepared if required by the business area manager responsible for approving the trial plan. This should include the cost of evaluation and reinstatement (if necessary) at the end of the trial. The funding source should be specified with details of contributions from external organisations. In certain cases, it is not unreasonable for VicRoads to expect a proponent of a new or innovative treatment to contribute to the funding of a trial (for example, where a supplier will potentially gain commercial benefit if a product is ultimately approved for general use).

The trial plan should be prepared in consultation with stakeholders, including VicRoads’ business areas with relevant knowledge or technical expertise and the business area that would be responsible for producing or amending relevant guidelines, standards or specifications should the trial be successful.

The plan must include a risk assessment which identifies the risks associated with the trial and any control measures to manage significant risks. It should also include any additional performance indicators and measures required to assist with monitoring of risks and disbenfits. The risks to be considered should include, but not necessarily be limited to, the safety of road users, other road user impacts, legal, financial, VicRoads’ reputation and implications in the event that the trial is unsuccessful.

The trial plan is to be approved by the manager (or delegate) of the business area responsible for the trial. The trial details shall then be entered into the register of on-road trials of new and innovative treatments and updated as the trial progresses, by the responsible business area.

Related Guidelines Principles

* Minimise, as far as practicable, all safety, legal, reputational and financial risks associated with the on-road trial.
* Ensure that the on-road trial will enable the benefits and impacts of a new or innovative treatment to be evaluated.
* Identify and engage key internal and external stakeholders to ensure that the on-road trial is conducted in a robust and efficient manner.

Conducting the Trial

The on-road trial can commence once all data that is required before installation of the treatment has been collected. The business area responsible for the trial shall update the Register of On-road Trials once the trail has commenced.

If monitoring of the trial indicates that it is not proceeding satisfactorily, it may be necessary for the trial to be modified or abandoned. Factors that may result in the modification or abandonment of a trial may be related to safety, operations or road user / community feedback. A trial may also be terminated if it becomes apparent that the treatment will not produce satisfactory benefits. If a trial is abandoned or terminated, trial sites must be reinstated to pre-trial condition or, if not practicable, a suitable state.

Upon completion of the trial, the treatment is to be either removed and conditions reinstated, or retained, as specified in the trial plan.

Related Guidelines Principles

* If there are unacceptable safety, operational or other adverse impacts during a trial, or the trial is unsuccessful, trial sites must be reinstated to their original, or acceptable, condition as soon as practicable.

Evaluating the Trial

The final step of the trial phase is completion of the evaluation and reporting of the results. Based on the outcome of the trial, recommendations should be made regarding the ongoing use of the treatment, including how and where the treatment could be rolled out.

The business area responsible for the trial shall advise stakeholders of the results and update the register of on-road trials, which should include advice on where to obtain a copy of the evaluation report. Care needs to be taken regarding any confidential information pertaining to proprietary products.

Related Guidelines Principles

* The outcome of the trial is to be communicated to all key stakeholders.

Post-trial Phase

As with the pre-trial phase, the process in the post-trial phase will vary for different treatment types. Approval of a new or innovative treatment for general use may involve changes to specifications, design standards or guidelines.

The business area responsible for the relevant standard or guideline should consider recommendations regarding the roll out of the treatment and prepare a business case to support a funding proposal if necessary.

The scope of this guideline does not include details of practices and requirements in the post-trial phase.

1. Exceptions

Ad hoc on-road trials that do not comply with the requirements of this guideline may be conducted in some circumstances. For example, where a treatment is applied to address a localised issue and it is not intended to pursue approval for its general use on the road network. However, in such cases an appropriate pre-trial assessment of the treatment would usually be necessary to confirm that the treatment is needed and that options have been considered.

1. Evaluation and Review of this Guideline

Guidelines will be evaluated and reviewed on a regular basis to monitor their progress towards achieving the desired outcomes. Refer to the Evaluation Record (QD: #2634098)

1. Related documents

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| Document Title | QuickDocs Ref |
| Benefit Management Framework | # 1095952 |
| Investment Evaluation Framework, Post Completion Evaluation | # 2441936 |
| Register of On-roads Trials of New & Innovative Treatments | # 2607510 |
| Evaluation Record – Conducting On-road Trials of New & Innovative Treatments, Devices and Treatments  | # 2634098 |

1. Contact details

Questions relating to this policy should be directed to the Manager Network Standards, Network Policy and Standards.

1. Guideline Governance Summary

| Guideline Ownership and Approval Record |
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| Business Area Owner: Policy and Programs |
| Approval | Action | Position | Date |
| Recommend | Manager Network Standards | 26/08/2014 |
| Approved | Director Network Policy & Standards | 26/08/2014 |
| Date of Effect | This guidelines will take effect upon approval |
| Version No. | 1 |

**Attachment A: Process Diagram for On-road Trials of New and Innovative Treatments**

**Attachment B: ITS Type Approval Process**

Intelligent transport system (ITS) products typically are subject to a *type approval* process.

The type approval process in VicRoads is currently managed by the Product Acceptance Committee that is coordinated by Road Operations, ITS Infrastructure and Systems.

New and innovative ITS products fall into one of the following categories:

* Those for which there is a current specification
* Those for which there is no current relevant specification
* Those that may satisfy the performance criteria of a current specification but not other requirements.

A product that falls within the first category is assessed to ensure that it complies with all requirements of the relevant specification and Australian Standard and, if so, a field evaluation (if required) may proceed. Type approval would be issued subject to successful completion of the field evaluation.

ITS products that fall within the other categories are subject to a comprehensive assessment in the pre-trial phase to ensure compliance with relevant standards and regulatory requirements and to assess whether the product is likely to satisfy performance requirements, including compatibility with existing systems.

An Austroads project[[3]](#footnote-3) that aims to develop a harmonised national product acceptance process for ITS products is currently in progress. It is intended that VicRoads will review and amend its current process to complement the national approach once the Austroads project has been completed.

The proposed Austroads product acceptance process consists of the following steps:

Step 1: Determination of performance requirements

Step 2: Preliminary product assessment

Step 3: Desktop audit

Step 4: Laboratory testing

Step 5: Field testing

Step 6: Reporting and entering into the Austroads register.

With regard to field testing for type approval purposes, performance measures for new or innovative ITS products are typically related to reliability, durability and system compatibility.

For further information regarding the type approval process contact the Manager ITS Infrastructure and Systems.

**Attachment C: Road Safety Barrier Products**

A national process has been established to assess safety barrier products for use on public roads. This process is the responsibility of the Austroads Safety Barrier Assessment Panel (ASBAP). ASBAP provides the safety barrier industry with a single point of contact on behalf of the state roads authorities for the purpose of assessing new safety barrier products. The assessment of suitability comprises the physical device and its performance in addition to the technical and operational capability of the supplier to support it.

Safety barrier products include longitudinal barriers, barrier terminals, barrier systems (i.e. longitudinal barrier / terminal combinations), crash cushions, single hazard protectors, energy absorbing bollards and barrier gates. They include products for permanent or temporary use. ASBAP’s role also extends to other road safety hardware that is crash tested in accordance with a recognised standard (e.g. frangible lighting poles and sign supports).

A *Safety barrier assessment, Submission information pack* details the submission process and the information required (which is extensive) in support of a submission. ASBAP coordinates a risk assessment of a product based on the information submitted and makes a determination on whether the product is recommended for use on the road network. A product recommendation may be subject to conditions of use.

ASBAP determinations are purely recommendations to state road authorities to consider use of the product on the road network within their jurisdiction. Acceptance of the product is the responsibility of the relevant state road authority.

VicRoads may withdraw or modify acceptance of a product at any time as result of re-evaluation or in-service performance.

The ASBAP assessment process does not consider that barrier products may be trialled on the road network prior to acceptance. However, it does make provision for in-service reviews following recommendation or acceptance. The Submission Information Pack states:

*Information on in-service performance is collected on installed barrier products. The in-service performance may be used in periodic review of products or trigger a re-evaluation of a product.*

Ultimately, the decision to trial a new or innovative barrier product would lie with VicRoads.

For further information regarding safety barrier products contact the Manager Road Standards and Traffic.

**Attachment D: Pavement & Construction Materials**

VicRoads has a documented process for the assessment of innovative pavement and construction materials. While the documentation was prepared for internal use, it is made available to industry as required.

The process involves the following steps:

* + - 1. Initial request for consideration of innovation – Submissions are prepared on a standard form which is lodged with the Principal Advisor Pavements and Materials (PA P&M).
			2. Preliminary assessment – Proceeds if it has been determined that VicRoads is best placed to consider the submission. The objective of the preliminary assessment is to identify that the innovation has potential value before moving to the next step.
			3. Market readiness test and desk top assessment – Market readiness is required as VicRoads is not involved with product development. Information relating to the innovation is examined to decide if it is appropriate to proceed with a comprehensive assessment.
			4. Assessment Panel and Action Plan – An action plan is developed, which is overseen by a panel that includes a technical specialist and the proponent. A representative of Metropolitan / Regional Operations is included on the panel if a field trial is proposed. The action plan is to be agreed by the PA P&M and Regional / Project Director as appropriate.
			5. Implementation – Proceeds subject to finalisation of costs and funding sources. A field trial, if required, is part of this step. Field trials are managed by a region or project.
			6. Comprehensive assessment – Is conducted by the Assessment Panel in accordance with the Action Plan.
			7. End of assessment – The assessment is complete once all relevant VicRoads documents (specifications, technical notes, policies etc.) have been amended in accordance with the findings or when the innovation is not approved.

ARRB Group is promoting a national approach to material product evaluation and is piloting a scheme based on Queensland’s Transport Infrastructure Evaluation Scheme (TIPES). The scheme is confined to the assessment of road pavement construction products at the current time.

The assessment process culminates with the preparation of a Technical Opinion based on the product and its assessment. Where the Technical Opinion is favourable, a certificate of registration is issued which allows publication and distribution of the Technical Opinion by the applicant. However, there is no guarantee that the product will be accepted by any road agency.

Fees apply for application, initial assessment, field performance trial assessment and publication of outcomes.

TIPES is currently endorsed by the Queensland, South Australian, Tasmanian and the Northern Territory state road agencies.

For further information regarding pavement and construction materials contact the Manager Pavement Technology or Manager Construction Materials.

1. The IEF and is available on Exchange, together with other information on managing investments, at How to > Find P&P Information > Manage Investments (QD#2441936) [↑](#footnote-ref-1)
2. The BMF provides guidance relating to benefits, key performance indicators and performance measures (QD#1095952) [↑](#footnote-ref-2)
3. Project NT1803 Development of Product Acceptance Techniques for Network Devices [↑](#footnote-ref-3)