



Electricity Engineers'
Association

Draft for consultation

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Temporary Traffic Management – Risk-based Scenarios Electrical Distribution Industry

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HEALTH + SAFETY

ASSET MANAGEMENT

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Temporary Traffic Management – Risk-based Scenarios Electrical Distribution Industry

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Disclaimer

This guide has been prepared by representatives of the electricity supply industry to provide guidance on safety practices for use by the industry.

This guide is recommended as good practice by electricity supply industry representatives, but it is not a substitute for legislative or other regulatory requirements. If there is uncertainty on what guidelines or legislative requirements should apply in any situation, specialist advice, including legal advice, should be sought.

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This guide has been prepared on the basis that the user will be appropriately trained, qualified, authorised, and competent.

Status of Examples and Case Studies

Examples including sample processes, or case studies in this guide are included to assist with consideration of health and safety issues. The examples or case studies are not a comprehensive statement of matters to be considered, nor steps to be taken, to comply with any Statutory Obligations pertaining to the subject matter of this guide.

Purpose

This document provides practical guidance for Electricity Distribution Business's (EDBs) to assist with the consideration of major risk factors involved with work in the road reserve, not just temporary traffic management risks, and assessment of the appropriate risk mitigation and control measures.

Background

How Temporary Traffic Management is planned and executed is moving from prescribed measures to assessment of appropriate measure for risk-based scenarios. The WorkSafe *Guide to Keeping Healthy and Safe while Working on the Road or Roadside* was written in May 2023 to provide advice on how to manage the health and safety risks road and roadside workers are exposed to while at work. The WorkSafe Guide is applicable to EDBs to support the application of good risk management principles to meet their *Person in Control of a Business or Undertaking (PCBU)* duties under the *Health and Safety at Work Act 2015*.

Alongside the WorkSafe guide the *New Zealand Guide to Temporary Traffic Management (NZGTTM)* has been developed to potentially replace the New Zealand Transport Authority (NZTA) - Waka Kotahi *Code of Practice for Temporary Traffic Management*. It has been recognised that for Temporary Traffic Management (TTM) activities NZTA is not a regulator, and the Code of Practice does not address each PCBU's obligation to discharge their duties under the *Health and Safety at Work Act 2015*.

The NZGTTM outlines how to use a risk-based approach to plan and mitigate the risks to road workers and road users to keep them safe. The new risk-based approach ensures that the deployed TTM manages the specific risks at each work site so far as is reasonably practicable.

Acknowledgements

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1. Application for Electricity Distribution Business

Each individual EBD has its own risk profile made up of both external and internal contexts:

- Natural and built environments
- Regulatory framework
- Financial and contractual constraints
- Relationships with, and perceptions of stakeholders
- Governance structure and accountabilities
- Technological and operational capabilities
- Standards, guidelines, systems and processes adopted by the EDB
- Operating model for Temporary Traffic Management (TTM) capability and resources

Due to the differing risk profiles, no attempt has been made to quantify the Scenario-based Risk Factors as it is expected that the EDB will apply their own risk assessment framework to determine appropriate mitigation measures.

The *NZGTTM* provides examples of risk factors and control measures appropriate to a risk-based approach to which EDBs should refer.

2. Scope

The scope of this guideline is limited to both planned and unplanned work which is:

- Short term duration, and
- Low risk to road users, and
- Being carried out in the road reserve, meaning it is not in a live lane; and
- Where the primary role of the persons doing the work is not temporary traffic management.

The reasoning for this is as follows.

- Unplanned work is by nature reactive; however, we need to balance EDBs legislative obligations to restore the supply of electricity as soon as practical with the requirement to keep workers and the public safe on the road.
- In an emergency EDBs have the ability to effect a staged response (i.e. if we can call out a secondary crew with Elevated Work Platforms and Hiabs, we can also call out dedicated TTM resources at the same time). For further information refer to *NZGTTM page 54 Emergency Response*

- Work that is outside the scope of this guide includes planned work that involves disturbance of the road surface, or more than 24 hours occupation of the road reserve, this is similar enough in nature to existing TTM used for civil infrastructure work therefore a full *Traffic Management Plan* with potentially more comprehensive TTM would be required. This level of TTM may require external TTM expertise to determine the appropriate risk based mitigations.

3. How to use the Scenario-based Risk Factor examples

TTM risks are only one facet of the risks faced at each site by our workers. The purpose of this guideline is to assist with the consideration of major risk factors involved with the work, and assessment of appropriate control measures.

For example, a crew working in proximity to an energised overhead line when deciding where to position mobile plant must consider both the minimum approach distance to live conductors as well as the lateral exclusion zone to the live lane of the road. After risk assessment is carried out and all factors considered, the EDB will decide on the appropriate TTM measures.

The appendices provide examples of risk factors for different scenarios. For example, Appendix A provides examples of risk factors for Overhead Line Patrolling. The orange boxes in the right-hand column are provided for individual EDBs to record their risk rating for the given risk factor.

The risk factors have been broken down into the following categories:

- Operational Risk Factors
- Network Asset Risk Factors
- Road User Risk Factors
- Road and Environment Risk Factors

Consideration has been given also to whether the scenario impacts on the live lane or pedestrian diversion – as this increases the risk to both workers and road users.

Risk factors should not be considered in isolation as control measures for each risk could impact on the effectiveness of other control measures for separate risks. This will avoid risks being transferred or created elsewhere.

EDBs should weigh up the benefits of a particular control measure against any potential risks it creates elsewhere and look at a solution that provides the least total risk to all affected parties.

This guide deliberately concentrates more on the risk factors relevant to the electrical distribution industry's road corridor worksites rather than detailed TTM risk factors.

There is very good, detailed information on Road User Risk Factors in the Practice Note: Protecting Vulnerable Road Users in Temporary Traffic Management Environments, and Road and Environment Risk Factors in the NZGTTM Supplementary Activity and Environment Information.

It is recognised that EDBs will have their own specific network activities, not included in the scenarios provided and it is recommended EDBs develop and record their own risk assessment for these activities.

4. References

New Zealand Government	Health and Safety at Work Act 2015.
New Zealand Government	Utilities Access Act 2010
WorkSafe New Zealand	Guide to Keeping Healthy and Safe while Working on the Road or Roadside.
NZ Transport Agency Waka Kotahi	New Zealand Guide to Temporary Traffic Management.
NZ Transport Agency Waka Kotahi	New Zealand Guide to Temporary Traffic Management Supplementary
NZ Transport Agency Waka Kotahi	New Zealand Guide to Temporary Traffic Management Supplementary
NZ Transport Agency Waka Kotahi	New Zealand Guide to Temporary Traffic Management Supplementary
Civil Contractors NZ	Practice Note: Protecting vulnerable road users in Temporary Traffic Management Environments.

5. Appendices Scenario-based Risk Factor - Risk Criteria

Examples only – each EDB will need to review and develop their TTM risk factors based on their risk profile.)

Appendix A Overhead Line Patrolling

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OPERATIONAL RISK FACTORS	Risk Rating
Travelling below posted speed limit – especially Category B roads (over 65 km/hr)	
Pulling in and out of live lane regularly	
Entering / exiting vehicles frequently	
Remote or isolated work	
Distance travelled (fatigue implications)	
Network pressure	
NETWORK ASSET RISK FACTORS	Risk Rating
Physical distance of poles from edge-line of live lane	
Complexity of OH line -road crossings / number of Tx fuses, sectionalisers, switches / number of tap-offs	
Where the 'point of supply' network - service line demarcation exists	
Physical length of spur lines and need to patrol parallel spurs	
ROAD USER RISK FACTORS	Risk Rating
Urban vs rural location	
Volume of traffic and pedestrians - does it significantly differ over time?	
Heavy traffic on single lane or constrained width roads - logging trucks / milk tankers / school buses / stock trucks/ rubbish collection	
Road works	
Visibility of worker to road users	
ROAD AND ENVIRONMENT RISK FACTORS	Risk Rating
Road geometry	
Forward sight distance vs rear sight distance - especially if travelling significantly slower than posted speed.	
Ability to change direction: U-turn or reverse up?	
Time of day – day or night / sunstrike	
Weather - fog, mist, rain / dust clouds / windblown debris	
Operate in adverse weather conditions - rain / snow / ice/ high winds / mud.	
Closed vs impassible roads due to snow / flooding / slips / trees.	

IF IMPACTING ON THE LIVE LANE OR PEDESTRIAN DIVERSION.	Risk Rating
TTM complexity - availability of vehicles, placement / removal of signage for each road intersection?	
TTM deployment time.	
Disruption to traffic flow.	
Ability to resource TTM after-hours.	

Appendix B Planned Maintenance Activities in Road Reserve

OPERATIONAL RISK FACTORS	Risk Rating
Inability to survey from vehicle or side of road.	
Maintenance activities may be on private property accessed from road reserve	
Restricted access to area	
Worker focused on maintenance	
Less situational awareness of traffic – focused away from traffic flow	
Any additional PPE required for task - reduce situational awareness	
Minimum Approach Distances / Flashover	
Lone or remote worker	
Hazardous substances – weed spray etc.	
NETWORK ASSET RISK FACTORS	Risk Rating
Equipment in distress	
Live equipment - is it touch safe when enclosure is open?	
Condition of asset – age / maintenance status / distress / loading / known design issues.	
ROAD USER RISK FACTORS	Risk
Visual distractions	
Pedestrian shy lines	
Obstructing footpath or driveways	
Distractions	
Access to live lane	
Worker not visible to road user	
ROAD AND ENVIRONMENT RISK FACTORS	Risk
Visibility	
Resident access	

Draft for consultation

Appendix C Pole Inspection

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OPERATIONAL RISK FACTORS		Risk Rating
Travelling below posted speed limit – especially Category B roads (over 65 km/hr).		
Pulling in and out of live lane regularly.		
Entering / exiting vehicles frequently.		
Remote or isolated.		
Less situational awareness of traffic – focused on pole and data recording.		
Type of pole testing undertaken - invasive probing and digging / post testing device.		
Method used to measure height of spans - tele-pole / laser / other.		
Need to be in live lane to measure height of overhead road crossings.		
NETWORK ASSET FACTORS		Risk
Physical distance of poles from berm to edge-line of live lane.		
Pole location on footpath – often away from boundary.		
Complexity of overhead line road crossings / number of Transformer fuses, sectionalisers, switches / number of tap-off and service lines.		
Where the 'point of supply' network - service line demarcation exists.		
Probing and digging technique invasive to road reserve, requires reinstatement.		
ROAD USER FACTORS		Risk
Urban vs rural location.		
Volume of traffic - does it significantly differ over time?		
Pedestrian management		
Heavy traffic on single lane or constrained width roads - logging trucks / milk tankers / school buses / stock trucks/ rubbish collection.		
Road works		
Visibility of worker to road users.		
IF IMPACTING ON THE LIVE LANE OR PEDESTRIAN DIVERSION.		Risk Rating
TTM complexity - availability of vehicles, placement/removal of signage for each road intersection?		
TTM deployment time		
Disruption to traffic flow		

Appendix D Repairing a Link Box / Pillar / Distribution Box

Draft for consultation

OPERATIONAL RISK FACTORS		Risk Rating
Uncontrolled release of live electricity – isolating and making safe.		
Minimum Approach Distance to exposed conductors		
Network pressure		
Remote or isolated work		
Fatigue if undertaking fault response		
Less situational awareness of traffic – focused on box or pillar at ground level away from traffic flow		
Public safety - Is asset touch-safe when open?		
Is this a 'make safe and secure' activity, with planned repair response at a later time/date?		
NETWORK ASSET RISK FACTORS		Risk Rating
Location of asset - normally hard against boundary / often right beside driveways.		
Siting of asset - Ground mounted / underground / secure area.		
Proximity to high public risk area - school / supermarket etc.		
Physical footprint of equipment.		
Accessibility of asset – weight, size, requirement for specialized plant or equipment.		
Accessibility of site for vehicle and worker.		
ROAD USER FACTORS		Risk Rating
Urban vs rural location.		
Volume of traffic (does it significantly differ over time?).		
Pedestrian management - most Link boxes / Pillars / Distribution-boxes are on urban footpaths.		
Vehicles entering or exiting driveways in proximity of the work zone.		
Road works / Rubbish collection.		
Visibility of worker to road users.		
ROAD AND ENVIRONMENT FACTORS		Risk Rating
Road geometry.		
Clear sight distances.		
Time of day – day or night / sunstrike.		
Weather - fog, mist, rain / dust clouds / ice.		
IF IMPACTING ON THE LIVE LANE OR PEDESTRIAN DIVERSION		Risk Rating
TTM complexity – especially pedestrian interaction.		
TTM deployment time.		
Disruption to traffic flow.		
Ability to resource TTM after-hours.		

Appendix E Streetlight Maintenance

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OPERATIONAL RISK FACTORS		Risk Rating
Inability to maintain / repair		
Visibility of LEDs during drive by inspection		
Elevated Work Platform intruding into live lane		
Elevated Work Platform failure		
Streetlight power panel work in pedestrian path		
Vehicle parking away from worksite		
Arriving and leaving site		
Close Approach Consent or Live Work permit needed?		
Falling objects / exclusion zone		
NETWORK ASSET FACTORS		Risk Rating
Streetlight too close to Live overhead conductors		
Asset condition		
Faulty fittings causing falling objects		
Installation work – testing, impact on traffic light circuit		
ROAD USER FACTORS		Risk Rating
Curious pedestrians – talking about heritage streetlight design		
Dropped objects		
Distracted motorists		
Suitable vehicle access		
ROAD AND ENVIRONMENT RISK FACTORS		Risk Rating
Night work		
Inadequate lighting		
Weather conditions – especially wind.		
Traffic volumes		
Streetlight in high pedestrian, urban dense area e.g. wharf, bridges, open malls, city squares		

Appendix F Switching a Roadside Ring Main Unit (RMU) or Air Break Switch (ABS)

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OPERATIONAL RISK FACTORS	Risk Rating
Uncontrolled release of live electricity – switching	
Network pressure	
Receiving and responding to switching instruction from Network Control – accessibility of radiotelephone (RT) or cellphone	
Time taken to perform switching – awaiting instructions from Network Control (are there multiple switching operations and/or locations?)	
Remote or isolated work	
Fatigue if undertaking fault response	
Less situational awareness of traffic – focused on activity away from traffic flow	
Additional Arc-rated PPE requirement – wearing anti-flash hoods / anti-flash goggles / bomb suits / ear plugs reduce situational awareness	
NETWORK ASSET RISK FACTORS	Risk Rating
Location of asset - RMUs and ABSs are often on road intersections	
Siting of asset – ground mounted / pole mounted/ secure area	
Physical footprint of equipment	
Does removal of any covers or opening of doors impede pedestrians or traffic?	
Public safety - Is asset touch-safe when open?	
Condition of asset – age / maintenance status / distress / loading / known design issues	
Network requirement for exclusion zones and soak times	
Proximity to high public risk area - school / supermarket etc.	
Accessibility of site for vehicle and worker	
ROAD USER RISK FACTORS	Risk Rating
Urban vs rural location	
Volume of traffic (does it significantly differ over time?)	
Pedestrian management - especially if exclusion zone is required	
Road works	
Visibility of worker to road users	
Does this significantly impact on traffic and / or pedestrian flow?	

ROAD AND ENVIRONMENT RISK FACTORS	Risk Rating
Road geometry	
Clear site distances	
Time of day – day or night / sunstrike	
Weather - fog, mist, rain / dust clouds / ice	
IF IMPACTING ON THE LIVE LANE OR PEDESTRIAN DIVERSION	Risk Rating
TTM complexity – especially pedestrian interaction	
TTM deployment time	
Disruption to traffic flow	

Appendix G Tree Trimming / Vegetation Removal

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OPERATIONAL RISK FACTORS	Risk Rating
Mobile plant use	
Vehicles position on worksite, ability to undertake U turns	
Drop zone / falling vegetation	
Working at height	
Safety observer position	
Mobile worksite	
Damage to property from cutting, falling objects	
Civil plant / vehicle if stumping required, chipper, dump truck	
Workers at ground or at height	
Minimum Approach Distance to live assets	
Chainsaw operation	
Direction plant required to move to manage cutting, sometimes against traffic flow	
Restricted work zone	
Weather conditions, including wind	
Number of workers on site	
Managing debris on side of road	
Size of tree	

NETWORK ASSET RISK FACTORS	Risk Rating
Clearance requirement (SAIDI)	
Fire risk if not trimmed	
Latent damage, items on overhead line and equipment	
Type of asset, voltage / condition	
Accidental tripping	
Loss of supply (reclosers disabled during work task)	
Reactive or planned work	
ROAD USER RISK FACTORS	Risk Rating
Visual impact – distraction / rubber necking	
Falling/ flying vegetation impacting lane	
Abandoned debris	
Equipment position	
Obstructions	
Surface condition changes (soft ground / mud / ruts)	
ROAD AND ENVIRONMENT RISK FACTORS	Risk Rating
Mobile plant size for job and distance required to maintain lateral safety	
Nearby activities / time of day	
Noise levels on site	
Rural vs Urban	
Adverse weather	
Road conditions	
Speed and volume of traffic on road	
Debris or mulch left on road, or in drains impacting road surface and surrounding environment.	
Damage to roadside berm – soft ground / mud	