# TMR response to the independent review by Transport Management Consulting ‘Emergency Vehicle Priority System Investigation’

**January 2024**

# Control sheet

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|---|---|---|---|
| **Division(s)** | Infrastructure Management and Delivery (IMD) | | |
| **Branch(es)** | Statewide Network Operations (SNO) | | |
| **DMS number** | 110/1680 | | |
| **Project code** | 2324-MR-06 | | |
| **Key dates** | Terms of Reference confirmed | | 04/10/2023 |
| | Draft report issued to Client and Stakeholders | | 17/11/2023 |
| | Management responses received | | 20/11/2023 |
| | Management responses finalised | | 25/01/2024 |
| | Final report submitted to DDG IMD and Chief Engineer | | 25/01/2024 |
| | Final report submitted to Director–General | | 25/01/2024 |
| **Review team** | David Yee | TMC Transport Management Consulting | |
| | Michael Watts | TMC Transport Management Consulting | |
| **Approved** | Samara Dowling | Acting Chief Auditor | |
| | S.Dowling | | 25/01/2024 |
| **Noted** | Sally Stannard | Director–General | |
| | Noted by email on 29 January 2024 | | 29/01/2024 |

| **Report distribution** |
|---|
| Deputy Director-General, Infrastructure Management and Delivery Division |
| General Manager, State-wide Network Operations branch |
| Chief Engineer, Engineering and Technology branch |
| General Manager, Program Delivery and Operations branch |
| Director (Operational Systems), State-wide Network Operations branch |

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# Contents

# 1. Executive summary

## Background and context

The STREAMS Emergency Vehicle Priority (EVP) system allows emergency vehicles to automatically trigger traffic light sequences to change along the most direct route when responding to an emergency call. TMR uses STREAMS EVP (a capability of the STREAMS platform, provided by Transmax) to safely deliver green traffic signals to emergency vehicles to allow their unimpeded passage through controlled intersections.

The Brisbane City Council (BCC) also uses this EVP solution, however sitting separate and in parallel to TMR's state-wide solution (necessary due to BCC using the SCATS arterial management system instead of STREAMS), which sits on a TMR server at the Brisbane Metropolitan Traffic Management Centre (BMTMC).

As a part of the TMR SEQ Platform upgrade works in late 2022, an issue occurred which resulted in the BCC EVP solution not functioning from 18 October 2022. This was identified on 1 March 2023 by Transmax and rectified by Transmax on 7 March 2023.

TMR's contracted supplier Transmax found that the issue was due to an unrelated system upgrade. TMR engaged Transport Management Consulting (TMC) to investigate the maintenance controls, processes and responsibilities for the EVP service, identify the root cause of the issue and make recommendations to prevent similar incidents in the future.

## Objectives and scope

The purpose of this review was to:

- assess the controls around the EVP system's maintenance
- understand and document responsibilities for managing this system
- understand and document processes to monitor the performance of the EVP system
- understand and document processes to monitor, identify and escalate issues in the performance of this system
- document at a timeline of events for the issue in October 2022.

Refer to **Appendix A** for further information on the scope and approach for this engagement and **Appendix B** regarding the key stakeholders interviewed.

## Conclusion

The 18 October 2022 incident was caused by an incorrect Internet Protocol (IP) address being assigned to a network switch, which was replaced as part of an unrelated TMR hardware upgrade. The IP address provided to the new network switch belonged to the BCC EVP STREAMS server. This IP address error made BCC EVP STREAMS inoperable, and no green signals could be requested for the EVP-enabled BCC traffic signals.

The EVP service has been operating across 310 BCC traffic signals since 2017, however, all EVP system components were not properly transitioned from the pilot project state into production by TMR and its project partners (Queensland Police Service (QPS) and BCC). Instead, each partner was focused on operating their own system components and no partner was formally responsible for monitoring or maintaining the BCC EVP STREAMS component.

This situation was caused by a lack of defined EVP service owner to take responsibility for overall service monitoring and management. This resulted in a lack of formal supplier agreements for the monitoring and maintenance of each system component. As such, the integrity of the EVP service could not be assured during any system change affecting its operation (as was apparent in the 18 October 2022 incident).

There are a number of other factors that contributed to the 18 October 2022 incident, including:

- Insufficient change controls (including testing and deployment requirements) by suppliers and their subcontractors. A more rigorous set of controls could have identified the system's issue at the time the switch was changed.
- Inappropriate EVP system component and data flow monitoring (including for BCC EVP STREAMS) to identify a lack of successful green light requests and responses.
- The EVP service using BCC signals has a higher level of complexity as it needs to communicate with SCATS to control these signals.

The investigation recommends that TMR and its EVP service partners QPS and BCC continue with the actions already underway and work collaboratively to address the identified recommendations. This will ensure the EVP service is effective and sustainable and continues to benefit Queensland.

## TMR management response

TMR agree with the report issued by TMC, and since March 2023, TMR, QPS, BCC and Transmax (as a key TMR partner) have undertaken a number of actions to improve the EVP service. These includes:

- TMR engaged Transmax to monitor the BCC EVP STREAMS server performance.
- TMR is negotiating with Transmax to include BCC EVP STREAMS server maintenance activities as part of their managed services contract.
- Brisbane Metropolitan Transport Management Centre operators are now monitoring EVP green light requests to BCC-controlled traffic signals.
- QPS are now monitoring the status of EVP green light request responses from STREAMS EVP servers across all of Queensland (i.e. TMR and BCC controlled signals).
- Transmax have improved their subcontractor change management processes following an internal review of the 18 October 2022 incident.
- TMR are holding monthly performance review meetings with key stakeholders (QPS, BCC and Transmax) to discuss EVP service performance.

In addition to the above, to address the recommendations raised in the report issued by TMC, TMR will lead the process to agree and formalise an EVP service owner and EVP service customer, along with roles and responsibilities for monitoring and maintaining each EVP system component.

Once EVP service ownership and management responsibilities are established, TMR will lead development of sservice management practices in conjunction with EVP service partners to assure the EVP service.

# 2. TMR response to recommendations

## 2.1 Improved Governance and Traceability of Regulations

RECOMMENDATION

**Recommendation(s)**

*What do TMC recommend?*

1. Establish an agreed and formalised EVP service owner and EVP service customer, along with agreed organisational roles and responsibilities for monitoring and maintaining each EVP system component.
2. Once EVP service ownership and management responsibilities are established, develop appropriate service management practices to assure the EVP service, including:
    - An overall EVP service transition management process to ensure service changes are documented, tested, released and appropriately deployed into the live environment.
    - A change management policy to define components under change control and to manage them effectively; and implement change management processes to receive, decide, and manage change requests.
    - Service level monitoring and management of all EVP components and data flows (including status, data content and quality).
    - Service performance monitoring and reporting, measurement, analysis and evaluation.
    - An incident management process for integrated and holistic incident detection and response.
    - EVP service and system documentation to provide common understanding across all stakeholder organisations; this includes an operations and support manual for TMR supplied components.
    - Customer relationship management between the service owner and its customers to ensure the EVP service requirements are defined and continually supported.
    - Agreements for maintenance and operation of all system components (including for BCC EVP STREAMS); this includes resources and funding for suppliers to ensure ongoing availability.

| **Management response(s)**<br>*What will management do to address the risk/ opportunity?* | **Action Owner(s) and due date(s)**<br>*Who will deliver the action(s), and by when?* |
|---|---|
| 1 Accepted. TMR will lead the identification and documentation of an agreed and formalised EVP service owner and EVP service customer, along with agreed organisational roles and responsibilities for monitoring and maintaining each EVP system component. This will be undertaken involving and through agreement with EVP partners, Queensland Ambulance Service (QAS), Queensland Police Service (QPS), Brisbane City Council (BCC), and Transmax.<br>2 Accepted. Once EVP service ownership and management responsibilities are established (Action 1), TMR will lead development of appropriate service management practices, in conjunction with agreed EVP service partners, to assure the EVP service, including all aspects that have been recommended. | **Action 1**<br>Director (Operational Systems), SNO branch<br>Due date: December 2024<br>**Action 2**<br>Director (Operational Systems), SNO branch<br>Due date: June 2025, noting this date is dependent on completion of Action 1 and participation of EVP service partners. |

# 3. Appendix A - Terms of Reference

Department of Transport and Main Roads (TMR)

## Internal Audit Terms of Reference – Emergency Vehicle Priority System Review

### Background

The Emergency Vehicle Priority (EVP) system allows emergency vehicles to automatically trigger traffic light sequences to change along the most direct route when responding to an emergency call. TMR uses STREAMS EVP (a capability of the STREAMS platform, provided by Transmax) to safely deliver green traffic signals to emergency vehicles to allow their unimpeded passage through controlled intersections. The Brisbane City Council (BCC) also uses this EVP solution, however sitting separate and in parallel to TMR's statewide solution (necessary due to BCC using the SCATS arterial management system), which sits on a TMR server at the Brisbane Metropolitan Traffic Management Centre (BMTMC). As a part of the TMR SEQ Platform upgrade works in late 2022, an issue occurred which resulted in the BCC EVP solution not functioning from 18 October 2022. This was identified on 1 March 2023 by Transmax and rectified by Transmax on 7 March 2023.

### Review objectives

This internal audit will:

- assess the controls around the EVP system's maintenance
- understand and document responsibilities for managing this system
- understand and document processes to monitor the performance of the EVP system
- understand and document processes to monitor, identify and escalate issues in the performance of this system
- document at a timeline of events for the issue in October 2022.

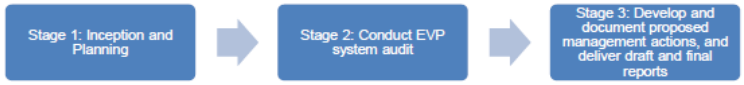
### Key risks

The key risk relevant to this internal audit is that a failure of the EVP system will impact the performance of emergency vehicles in their ability to transport patients safely and quickly for treatment.

### Approach

The engagement will address the project requirements to review the EVP system.

The review will focus on the EVP system maintenance controls relating to performance monitoring and performance issue management for the EVP system. The project will be divided into three stages as below:




#### Stage 1: Inception and Planning

In consultation with project stakeholders, define and agree the Terms of Reference (this document), document the EVP system scope and finalise project planning based on the Project Brief and Transport Management Consulting's Proposal. Scope Identification will be considered across the system dimensions of people, processes and technology.

#### Stage 2: Conduct EVP System review

Review EVP system documentation, analyse data, and consult stakeholders to create a baseline understanding the current EVP system operations and maintenance against industry best practice guides such as ISO20000 and ITIL for service management. This will include:

- Assessing the controls around the EVP system's maintenance using ISO20000 key operations for the topics of relationship and agreement management (business relationship management, service level management and supplier management for the EVP system components), resolution and fulfilment (incident and problem management) and performance evaluation (monitoring, measurement, analysis and evaluation, internal audit, management review, and service reporting) reflecting the relative maturity of the practices.
- Reviewing and defining the responsibilities for managing the EVP system against the three key ISO20000 topics mentioned above.
- Documenting the processes to monitor the performance of the EVP system, including:
  1. Monitoring of service level management
  2. Monitoring of supplier management for the EVP system components.
- Documenting the processes to monitor, identify and escalate issues in the performance of this system around how incidents are managed:
  1. Incident management (an unplanned interruption to service, a reduction to service quality or an event that has not yet impacted the customer or user).
  2. Monitoring, measurement, analysis and evaluation
- Conducting a review of the timeline of events that occurred for the issue and response in October 2022 and present this in a combination of graphical and/or textual forms.

A draft report will be prepared summarising findings or opportunities for improvement and high-level management actions.

#### Stage 3: Develop and document proposed management actions and provide draft and final reports.

Based on the Stage 2 findings, Stage 3 will develop proposed management actions to address the review findings and risks relating to the EVP system. This will include a prioritised list of actions to address the gaps and risks identified.

These will be presented initially in a draft report incorporating the review findings and proposed management. A final report that addresses TMR feedback will be provided.

### Estimated timetable

| Commence fieldwork | Finalise fieldwork | Draft report to management | Final report |
|---|---|---|---|
| 02/10/2023 | 30/11/2023 | 15/12/2023 – Stage 2 Report - Executive level briefing with draft findings<br>19/1/2024 – TMR Stakeholder feedback on Stage 2 report<br>16/2/2024 – Stage 3 Draft Report<br>1/3/2024 - TMR Stakeholder feedback on Stage 3 Draft | 15/3/2024 – Stage 3 Final Report |

Project code: 2324-MR-06

DMS reference no: 110/1680

## Key stakeholders and review team

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|---|---|
| **Review sponsor(s)** | Vincent Doran, General Manager (Statewide Network Operations) |
| **Management contact(s)** | Tracy O'Bryan, Deputy Director-General, Corporate<br>Vincent Doran, General Manager (Statewide Network Operations)<br>Edward Beak, Principal Advisor (Operational Systems)<br>Melissa Perkins, Director (Operational Systems)<br>John Oppes, Executive Director (Operational Technologies)<br>Sandra Slater, Chief Information Officer<br>Dennis Walsh, Non-Executive Director Transmax<br>Lynette Sperling, A/CEO Transmax |
| **Internal Audit team members** | Samara Dowling, A/Chief Auditor<br>Timothy Van Gool, A/Director, Internal Audit<br>David Yee, TMC Transport Management Consulting<br>Michael Watts, TMC Transport Management Consulting |

## Acknowledgement

Throughout this review Internal Audit will comply with the Public Service Commission's *Code of Conduct* and adhere to the mandatory elements of The Institute of Internal Auditors' *International Professional Practices Framework*; those elements are the Core Principles for the Professional Practice of Internal Auditing, the definition of internal auditing, and the *International Standards for the Professional Practice of Internal Auditing*.

Internal Audit appreciates your support and the cooperation of your staff as we work together.

S.Dowling

Samara Dowling
Acting Chief Auditor

## Review sponsor approval

As the sponsor, I confirm that I understand and agree with the above stated Terms of Reference.

| Sponsor name and title | Signature | Date |
|---|---|---|
| Vincent Doran, General Manager (Statewide Network Operations) |  | 04/10/23 |