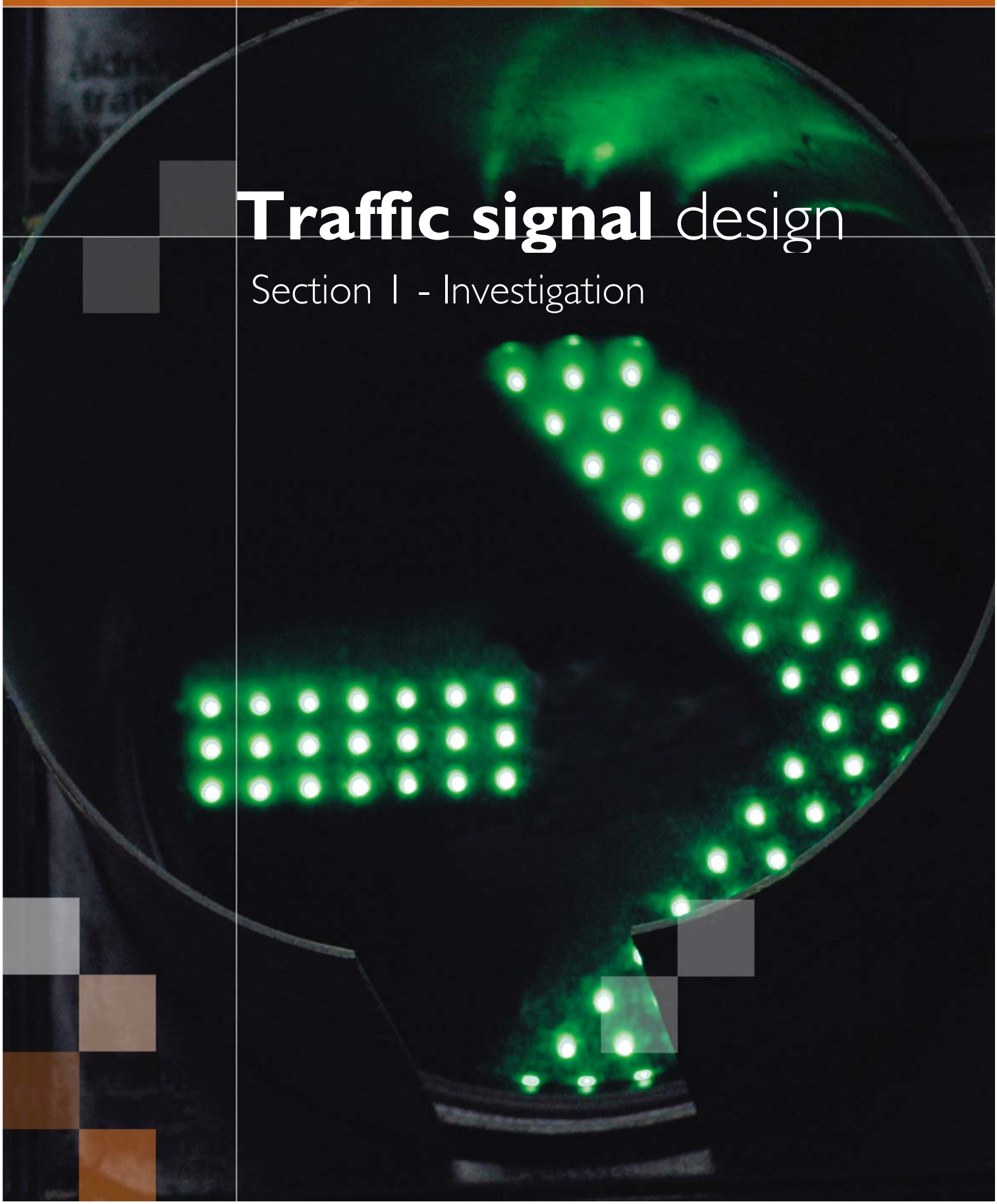
Traffic signal design

Section 1 - Investigation



The traffic signal design guidelines have been developed to assist in designing traffic control signals.

The guidelines are to comprise 16 sections and 5 appendices. These are initially being released individually and in no specific order. The sections which are to be released are as follows:

Part	Title
Section 1	Investigation
Section 2	Warrants
Section 3	Design Process
Section 4	Plan Requirements
Section 5	Geometry
Section 6	Pavement Marking
Section 7	Phasing and Signal Group Display Sequence
Section 8	Lanterns
Section 9	Posts
Section 10	Signs
Section 11	Detectors
Section 12	Controller
Section 13	Provision for Future Facilities
Section 14	Signalised Mid-block Marked Footcrossings
Section 15	Special Situations
Section 16	References
Appendix A	Design Plan Checklist
Appendix B	Traffic Signal Symbols
Appendix C	Location and Function of Lanterns
Appendix D	Location and Dimensions of Components
Appendix E	Left Turn on Red
Appendix F	Level Crossing Interface – Concept of Operations
Appendix G	Level Crossing Interface – Traffic Signal Design Guidance

To determine which sections are currently available go to:

www.rta.nsw.gov.au/doingbusinesswithus/downloads/technicalmanuals/trafficsignaldesign_dl1.html

The information contained in the various parts is intended to be used as a guide to good practice. Discretion and judgement should be exercised in the light of the many factors that may influence the design of traffic signals at any particular site. The guidelines make reference, where relevant, to current Australian Standards and are intended to supplement and otherwise assist in their interpretation and application.

Traffic Signal Design

Section 1

INVESTIGATION

Special Note:

As of 17 January 2011, the RTA is adopting the Austroads Guides (Guide to Traffic Management) and Australian Standards (AS 1742, 1743 & 2890) as its primary technical references.

An RTA Supplement has been developed for each Part of the Guide to Traffic Management and relevant Australian Standard. The Supplements document any **mandatory** RTA practice and any complementary guidelines which need to be considered.

The RTA Supplements **must** be referred to prior to using any reference material.

This RTA document is a complementary guideline. Therefore if any conflict arises, the RTA Supplements, the Austroads Guides and the Australian Standards are to prevail.

The RTA Supplements are located on the RTA website at www.rta.nsw.gov.au

Roads and Traffic Authority
www.rta.nsw.gov.au

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To access electronic copies of these and other guidelines go to:

www.rta.nsw.gov.au/doingbusinesswithus/downloads/technicalmanuals/technicalmanuals_dl1.html

For the latest amendments (if any) to these guidelines go to:

www.rta.nsw.gov.au/doingbusinesswithus/downloads/technicalmanuals/trafficsignaldesign_dl1.html

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Contents

Amendment record

Please note that the following updates have been made to this document.

Amendment No	Page	Description	Issued	Approved By

1.1 INTRODUCTION

The decision to install traffic signals at an intersection should be based on a thorough evaluation and comparison of alternative intersection design treatments for a particular site (see *Section 1.2).*

Requests for the installation of traffic signals may come from any of a number of sources including RTA officers, police, local councils, traffic committees, motoring organisations, developers, politicians, local community groups and members of the public. These requests usually arise because of an existing problem such as a record of traffic accidents, lane blockages, long queues, excessive delays or perceived safety concerns.

Traffic signals may also be considered for planning reasons to suit future road widening or deviation, street closures, development applications, local area traffic management (LATM) schemes, or anticipated traffic growth. Traffic signals are sometimes installed solely on an administrative directive.

Each officer must carefully follow this guide so that a high quality of design is attained to ensure the RTA's quality management objectives are met.

1.2 INVESTIGATION

An investigation into the suitability of installing traffic signals for any site should be done regardless of the reasons for initiating the proposal, except in the case of an administrative directive. Signalised and un-signalised concepts should be evaluated and compared with one another to ensure the most suitable intersection treatment is adopted. Where appropriate, various options should be investigated within each concept so the most suitable option can be identified for that concept. The depth of the investigation will depend upon the complexity of site conditions.

When an administrative directive demands the installation of traffic signals regardless of the suitability of other concepts that fact should be documented. Various signalised options should then be investigated so the most suitable option can be identified.

The two most important parts of an investigation are to:

- correctly identify the problem(s) to be solved, and
- ensure the geometry of any concept layout is in accordance with design guidelines and will provide a safe and efficient solution.

Nothing is gained by investigating any design concept that will not suit a site geometrically. The operational and physical constraints must be clearly identified. The problem(s) may be safety, geometry, capacity, or planning related. For example, safety issues may result from sub-standard intersection geometry and inadequate sight distance contributing towards accidents. Delays may result because gaps in conflicting traffic movements are difficult to obtain. Other delay problems can result from increases in traffic volumes. Planning problems can result from LATM schemes, new road openings, development access, and anticipated traffic growth.

An investigation must be done thoroughly to avoid major problems occurring during the detail design.

Investigation should take into account all relevant peak periods, such as weekday morning and weekday evening as well as conditions outside these periods such as off-peaks, business,

holiday, special event peaks and conditions which may result from future traffic growth. All likely pedestrian users of the intersection should be identified including the elderly and people with disabilities

A field inspection should be done at the investigation stage to ensure site conditions do not present insurmountable problems for any of the concepts or options investigated. Field inspection should ideally consist of several photographs of all approaches and any unusual features, and include aerial photographs if available.

The output of the investigation should be concept plans showing the geometric layouts used to evaluate all concepts investigated together with information supporting the concept designs. All signalised concepts must show phasing diagrams. Movement diagrams should be shown for more complex signalised intersections to ensure that all required movements are catered for in the proposed phasing.

If traffic signals are determined as the most suitable treatment, the concept plan should be adopted as the basis for preparation of the traffic signal design.

1.3 INSTALLATION PROCESS

The installation of traffic signals is a multi-disciplinary process which may be broken down into a number of distinct stages as shown in Figure 1.1.

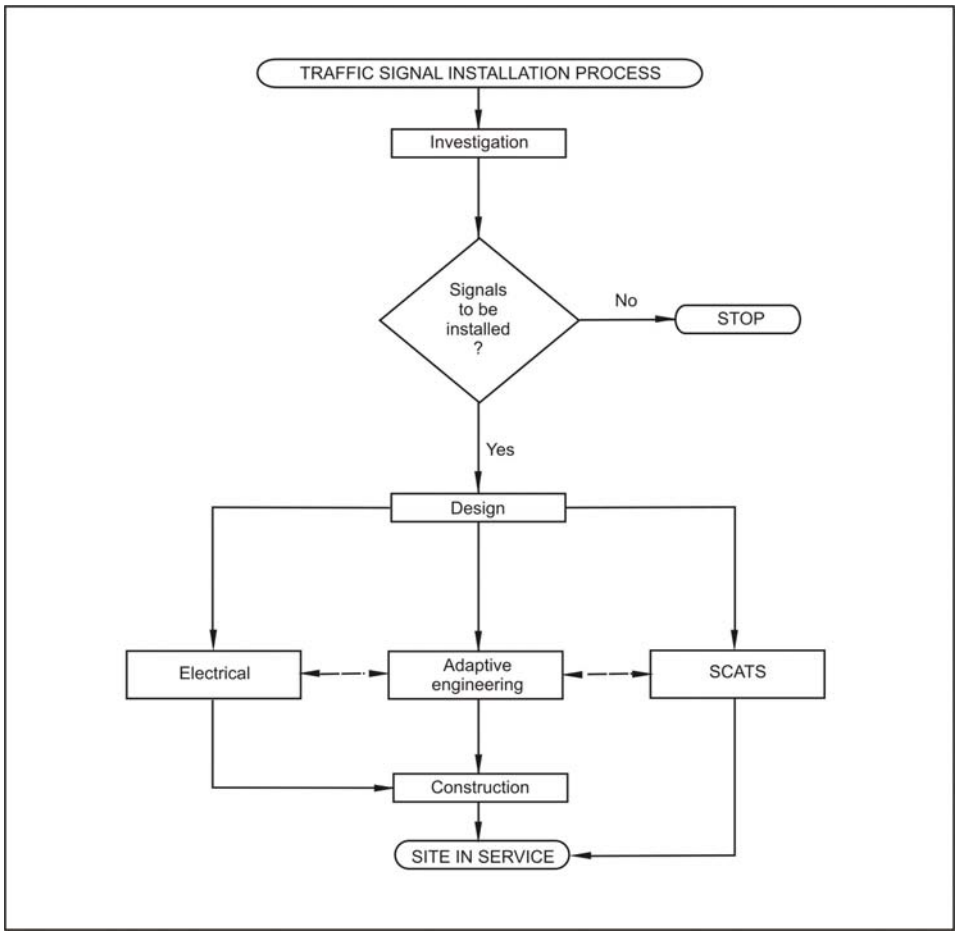

Figure 1.1 Stages in the installation process

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