

**Guide for the production of  
PIARC Technical Committee reports**

**Version: January 2006**

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# 1 INTRODUCTION

The production of Technical Committee reports is one of the most important outcomes of PIARC. It is important that the reports are of a high standard both in terms of content, accuracy and appearance.

A Technical Committee report presents the results of investigations on a selected topic. It is based on theories, facts and ideas gathered from Committee members and a variety of other sources.

The reports should provide a succinct reporting of the work of the Committee. They should not contain unnecessary material. They should be easy to read and communicate the results of the Committee's work clearly.

This guide has been produced to assist Technical Committees in the production of their reports and to ensure they are consistent with the requirements of PIARC.

## 2 PURPOSE OF THE REPORT

The Committee needs to make a clear statement about the purpose of the report, including the aims of the work itself. This should be established at the outset of the Committee's work.

A broad outline of the report should be prepared by the working group in charge of drafting the report and submitted to the Technical Committee for approval prior to the commencement of writing the report with a copy sent to the Strategic Theme Coordinator for possible comments. The Chair of the Technical Committee is responsible for the decision of approval.

A development plan for the report should be prepared prior to writing. It should include timeframe, responsibilities, etc.

There should be a statement which relates the aims of the work to the PIARC Strategic Plan and the terms of reference for the Technical Committee. This statement should be included in the introduction of the report. Where appropriate, reference should be made to earlier work of PIARC or others when this outside work forms a basis for the PIARC work being reported.

## 3 COMPOSITION OF REPORTS

Although reports can be on a range of topics and of various lengths, the reports should follow the same basic structure. This basic structure is divided into the following parts:

- statement about PIARC,
- authors statement,
- table of contents,
- summary,
- introduction,
- body,
- conclusions,
- bibliography / references,
- glossary,
- appendices.

### 3.1 Statement about PIARC

The statement to be used is shown in [Appendix B 1.1](#) to this Guide. It will be introduced by PIARC General Secretariat in the published version of the report. This standard statement about PIARC says which organization has produced the report, what is the status of this document and what is the extent of the responsibility of the organization with respect to the content of the report.

### 3.2 Authors statement

PIARC Technical Committee reports are not published under the name of individuals, but as the work of a Technical Committee. Information about who contributed to the production of the report should be a separate section at the beginning of the report and include the following:

- titles of the relevant Technical Committee and working group responsible for the report
- names and countries of origin of the members of the working group who actually contributed to the production of the report (not the list of all Committee members)
- names and countries of origin of the editors of the English and French versions
- names of the translators
- name and country of origin of the person responsible for the quality control of the report
- names and countries of origin of the chair and secretaries of the Technical Committee.

### 3.3 Table of contents

The table of contents should be displayed in a maximum of 2 sub-section levels.

The final version of the report will enable mouse click navigation from the table of contents to the selected chapter or sub-section when viewing online.

### 3.4 Summary

Although the summary appears first in a report, it should be written last. The summary contains a summarized version of the entire report, including particularly its purpose, what was done to arrive at the outputs and any conclusions or recommendations, and should not be more than two pages in length.

People who read PIARC reports want to manage their time effectively. They want to ensure that the report is of interest to them before they invest the time and energy to read the entire report. Our audience should know what is in the report from the summary.

### 3.5 Introduction

It provides a context so that the reader understands what is in the report. It introduces the contents and explains the purpose of the report. The introduction should generally contain the following components:

**Purpose** – The purpose describes why the report was written, what problem the report was meant to address or the situation that led to the report being produced. It should relate the report to the PIARC Strategic Plan and the terms of reference for the Technical Committee.

**Scope** – The scope describes the extent and limitations of the report. It tells the reader what specific aspects of the problem will be discussed. Where appropriate it should refer to earlier work of PIARC and others and explain how the report builds on that work.

**Methodology** – The methodology shows how the information presented in the report was obtained and what procedures were used, e.g. interviews or postal questionnaires. Sometimes an explanation is included of why a particular investigative approach / methodology was chosen.

### 3.6 Body

The body is the main and most informative part of the report. The value of the entire report is judged by the quality of the information in this section and the clarity with which it is presented.

It should contain all the information and evidence to make a case for solving the problem that the report addresses. It can be subdivided into different topic areas and contains graphs, data, diagrams, charts and tables.

Once all of the information has been gathered, the facts and arguments are presented in an organized and logical manner.

The content covered can include quantitative data outcomes and their analysis, observations, questionnaire outcomes and results of experiments, case studies and any qualitative information.

Present the information in the body in a clear and understandable manner. This involves several steps:

- Break down the information into manageable chunks.
- Use headings and point form to help guide the reader through the information.
- Place visual representations of the information in the appropriate places so the reader understands the main concepts.

The use of numbering should be restricted to 3 levels maximum (e.g. 1.2.1). The fourth level of a sub-section should have no numbering, identification is acceptable using an alpha character if this is absolutely necessary.

### 3.7 Conclusions

The conclusion clearly relates to the objectives of the work and outlines the main points, arriving at logical outcomes of the material presented. This is the place to draw together key points made in the report. However, nothing new should appear here.

If the report has, for the most part, simply provided information, the conclusions should summarise the major points of the report or offer some general insights.

Reports that are investigative and analytical or make proposals require different types of conclusions. They should contain conclusions that address the problem or situation under investigation.

Conclusions should always be as brief as possible and to the point. If there are a number of conclusions, use a numbered or bulleted list for these points.

### 3.8 Bibliography / References

PIARC Technical Committee reports should reference all books, articles, journals, websites, and any other sources consulted when writing the publication, using the standardized referencing system described in the **Appendix B 1.1**.

### 3.9 Glossary

The report will eventually contain a glossary, especially for acronyms and road concepts which are not yet included in the PIARC Dictionary. The glossary has to be produced in English and French. The production of a glossary is very important to help with the translation and for up-grading the PIARC Dictionary and Lexicon.

## **3.10 Appendices**

These should be placed at the end of reports. They should only include relevant information that is too lengthy or detailed to include in the body of the publication. However, attention should also be paid to the length of the appendices. An appendix should only be included if it has direct relevance to the report itself. Voluminous and extraneous material should not be included. Each appendix should contain different information. These should be referred to in the report and not just left to stand alone.

Where the work of the Committee includes a survey using a questionnaire there is no need to include the whole questionnaire as an appendix. The report itself should summarise the results so they are self explanatory.

## **4 GUIDELINES FOR THE LAY-OUT**

### **4.1 Template**

The reports should be prepared using the attached template for the lay-out ([Appendix B1.2](#)). This will ease the review and the production of the final version by PIARC General Secretariat.

### **4.2 Figures**

For the production of the final versions of the documents for dissemination on the web and printing, the PIARC Technical Committees are asked to gather together all illustrations (graphs, pictures, photographs) separately from the text itself (on a CD-rom for instance).

All artwork and photographs should be of high definition (min 300 dpi).

### **4.3 Final version of the reports**

The final version of the reports will be produced by PIARC General Secretariat in order to give a consistent presentation to all reports.

An example of the lay-out which will be used by PIARC SG for the coming reports is presented in [Appendix B1.3](#).

## **5 OTHER CONSIDERATIONS**

### **5.1 Translation**

All PIARC reports are to be produced in the two official languages of PIARC, namely, French and English. For each version, the Technical Committee must validate the translation by a member who is native-speaking in French or English regardless of whether the translation is done within the Technical Committee or outsourced. It should be noted that the PIARC secretariat does not have the technical expertise to ensure the quality of the translation in all fields.

### **5.2 Electronic and web-based reports**

This guide focuses on the preparation of the Technical Committee reports as an electronic file which can be printed.

In some cases, the Technical Committee may consider to produce its work in electronic format for a publication on the Internet or on CD-ROM with links to reference material or with software tools. Where this is envisaged, the format and production of these reports is to be discussed with the PIARC General Secretariat prior to commencement. However, the Technical Committee should present the key points of its work in a report with the same structure as the one described above in order to produce a PDF file.

# APPENDIX B1.1

## STATEMENTS

The text below is included in each report by PIARC General Secretariat in the final document.

Technical Committees don't have to include it in their draft document.

*"The World Road Association (PIARC) is a non-profit organisation established in 1909 to improve international co-operation and to foster progress in the field of roads and road transport.*

*The study that is the subject of this report was defined in the PIARC Strategic Plan 2004 – 2007 approved by the Council of the World Road Association, whose members are representatives of the member national governments. The members of the Technical Committee responsible for this report were nominated by the member national governments for their special competences.*

*Any opinions, findings, conclusions and recommendations expressed in this publication are those of the authors and do not necessarily reflect the views of their parent organizations or agencies.*

*International Standard Book Number xxxxxxxxxxxx (to be added by PIARC SG)*

*Copyright by the World Road Association. All rights reserved."*

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## APPENDIX B1.2

### STYLEGUIDE FOR THE PREPARATION OF THE REPORTS BY THE TECHNICAL COMMITTEES

This appendix gives a detailed description of the style sheets to be used by the Technical Committees for the production of a Word Document, in order to obtain consistency between the different documents and to ease the production of the final version.

***A template is provided as a separate Word file so that it can be used directly for the preparation of the reports.***

The reports must be prepared in black, using the font **TIMES New Roman**

This guide comprises six sections: Table of Contents, Standard text, Titles, Tables, Illustrations and Bibliography.

#### **TABLE OF CONTENTS**

The table of contents is limited to the following levels of titles.

A first level for **Summary, Introduction, Glossary** and **Appendices**.

A second level for the **Chapter titles** designed by : **1., 2., 3.**, etc.

A third level for the **Subheads 1** designed by: **1.1, 1.2, 1.3**, etc.

A fourth level for the **Subheads 2** designed by: **1.1.1, 1.1.2, 1.1.3**, etc.

Numbering starts with the Chapter titles (See example in Appendix B 1.3).

**Numbering** and the **pagination** are in Arab numeral followed by a point: **1., 2., 3.**, etc.

#### **STYLE SHEET for Summary, Introduction, Glossary and Appendices**

Example

**INTRODUCTION** ..... 4

**Characteristics for TM1:** Capital Letter, Bold. Font size: **8 pts**. Interline spacing: 12 pts.  
Set tabs left-justified with dots: **12.5 cm** between the last word and the pagination number.

#### **STYLE SHEET for Chapter titles**

Example

1. **WHAT IS ASSET MANAGEMENT?** ..... 9  
2. **WHY DO WE NEED ASSET MANAGEMENT?** ..... 11

**Characteristics for TM2:** Capital Letter, Bold. Font size: 8 pts. Interline spacing: 12 pts.  
Set tabs: **1.2 cm** between the numbering and the first word of the title.  
Set tabs left-justified with dots: **12.5 cm** between the last word and the pagination number.



## STYLE SHEET for Subheads 1

Example :

2.	WHY DO WE NEED ASSET MANAGEMENT?.....	11
2.1.	GENERAL ORGANIZATIONAL NEEDS .....	15
2.2.	NEEDS OF KEY DECISION-MAKERS .....	17

**Characteristics for TM3:** Capital Letter. Font size: **8 pts**. Interline spacing: 12 pts.

Set tabs: **0.3 cm** for the numbering.

Set tabs: **1.2 cm** between the numbering and the first word of the title.

Set tabs left-justified with dots: **12.5 cm** between the last word and the pagination number.

## STYLE SHEET for Subheads 2

Example

2.	WHY DO WE NEED ASSET MANAGEMENT?.....	11
2.1.	GENERAL ORGANIZATIONAL NEEDS .....	15
2.1.1.	Australia.....	17

**Characteristics for TM4:** Italic. Font size: **8 pts**. Interline spacing: 12 pts.

Set tabs: **1.2 cm**

Set tabs left-justified with dots: **12.5 cm** between the last word and the pagination number.

## STANDARD TEXT

### STYLE SHEET for standard text

The body text is fully justified. The first line of paragraph should not be indented. There is a blank line between two paragraphs.

Distinguish the words “**Figure**”, “**Graphic**”, “**Picture**”, **etc**”, from the rest of the text with **bold** letters. Do not use Italic, colour, etc.

**Characteristics for Standard text:** Regular or Roman Font. Font size: **11 pts**. Interline spacing: 12 pts.

### STYLE SHEET for lists

- One blank line between the text above and the list
- Set tab: **0.3 cm**
- Bullet point + set tabs: **0.3 cm**

Example :

“...the general components that most jurisdictions employ, implicitly or explicitly, either at a project level or a system level, to determine what work should or can be implemented:

- The objectives, or performance measures are first determined.
- The condition and the capital value of the road network, either on a section or network level...”

**Characteristics for Lists:** Regular or Roman Font. Font size: **11 pts**. Interline spacing: 12 pts.

## **TITLES IN THE REPORT**

The following types of titles are identified and can (must?) be used.

### **STYLE SHEETS**

#### **Summary, Introduction, Glossary, Appendices**

Example: **SUMMARY**

**Characteristics for TITLE INTRO:** Capital Letter. Bold. Font size: **12 pts**. Interline spacing: 12 pts. One blank line between the title and the first paragraph below.

#### **Chapter title**

Example: **1. WHAT IS ASSET MANAGEMENT?**

**Characteristics for TITLE 1:** Capital Letter. Bold. Font size: **11 pts**. Interline spacing: 12 pts. One blank line between the title and the first paragraph below.

#### **Subheads 1**

Example: **2.1. GENERAL ORGANIZATIONAL NEEDS**

**Characteristics for TITLE 2:** Set tabs: **0.4 cm**. Capital Letter. Bold. Font size: **10 pts**. Interline spacing: 12 pts. One blank line between the title and the first paragraph below.

#### **Subheads 2**

Example: **2.1.1 Australia**

**Characteristics for TITLE 3:** Bold. Font size: **11 pts**. Interline spacing: 12 pts. One blank line between the title and the first paragraph below.

#### **Lower titles**

Examples: **Austroads**

**Characteristics for TITLE 4:** Bold. Font size: **11 pts**. Interline spacing: 12 pts. No numbering. No blank line between the title and the first paragraph below.

## **TABLES**

No colour. Width of the black border: **1 pt**.

### **STYLE SHEET for the titles**

**Characteristics for TABLE TITLE:** Capital Letter. Bold. Centered. Font size: **9 pts**. Interline spacing: 12 pts.

### **STYLE SHEET for the texts**

**Characteristics Text TABLE:** Regular or Roman Font. Font size: **10 pts**. Interline spacing: 12 pts.

Example

<b>TITLE</b>	<b>TITLE</b>	<b>TITLE</b>
Text	Text	Text
Text	Text	Text

Maximum size of the table in a page:

- if vertical, width **12.5 cm**, height **18 cm**.
- if horizontal, width **18 cm**, height **12.5 cm**.

## **ILLUSTRATIONS**

When the report is sent to the PIARC General Secretariat for publication, **all illustrations (photographs, images, graphics) must be supplied on a CDROM, separately from the text**, together with the list of the captions. A CDROM is preferred since alteration may happen during transmission by e-mail.

Artwork (photographs, images) must be produced with a minimum format of **10x15 cm**, a high definition: **300 dpi**.

When creating a graphic, the maximum size of the original is:

- for a figure in a vertical page, width: **12.5 cm**, height: **18 cm**.
- for a figure in an horizontal page, width: **18 cm**, height: **12.5 cm**.

Within graphics use **ARIAL** font:

- **for titles:**

**Characteristics:** Capital Letter. Bold. Font size: **9 pts**. Interline spacing: 12 pts.

- **for other texts:**

**Characteristics:** Regular or Roman Font. Font size: **10 pts**. Interline spacing: 12 pts.

For graphs created with Excel, save the graph with its data in order to permit modification in the lay-out.

Whenever possible, in order to create graphics of high quality, use softwares such as Illustrator, In-Design or Photoshop.

## **BIBLIOGRAPHY / REFERENCES**

References to the bibliography should be numbered in increasing order (either the order in which references appear in the text or the alphabetic order of the authors).

The corresponding numbers should be enclosed in [ ].

A bibliographic reference for an article should contain in the following order:

- the surname of the author (in capitals),
- the initials of his/her first name (in capitals),
- the title of the article in its language of publication (enclosed in " " ),
- the name of the journal, using international abbreviations,
- the number of the journal,
- paging (beginning and end),
- the date (at least the year).

For a book the bibliographic reference should contain in the following order:

- the surname of the author (in capitals),
- the initials of his/her first name (in capitals),
- the title of the book (inside " ") followed by its subtitle,
- the name of the publisher,
- the place of publication,
- the date (year).

Examples:

[1] BOUSSINESQ, J. "*Application des potentiels à l'étude de l'équilibre et du mouvement des corps élastiques*", Gauthier Villars, Paris, 1885.

[2] PIARC TECHNICAL COMMITTEE ON ROAD BRIDGES  
"*Repair of bridges under traffic*", reference 11.03.B, PIARC, Paris, 1991

[3] FAIZ, A. "*An Overview of Automotive Air Pollution*", "*Routes/Roads*", PIARC Magazine, n°274, p.88-92, 1991.

## STYLE SHEETS

**Characteristics for BIBLIONAME:** **Numbering and Name** in Capital Letter. Font size: **10 pts**.  
Interline spacing: 12 pts.

**Characteristics for BIBLIOTITLE:** **Title** in Italic. Font size: 10 pts. Interline spacing: **12 pts**.

**Characteristics for BIBLIOINFO:** other information. Regular or Roman Font. Font size: **10 pts**.  
Interline spacing: 12 pts.

## **APPENDIX B1.3**

### **EXAMPLE OF FINAL LAY-OUT FOR PIARC TECHNICAL REPORTS**

PIARC technical reports will be prepared by PIARC General Secretariat, according to the attached example of lay-out from the material provided by the Technical Committees.

PIARC technical reports will be available from the Internet to be printed in A4 format.

The French text appears on the left hand pages (even numbers) and the English text on the right (odd numbers).

Having in mind issues of translation, the French and English texts are presented side by side, alignment is made paragraph by paragraph whenever possible.

The detailed specifications for the lay-out which will be used by the General Secretariat for on-line publishing and printing of the Technical Reports are defined in a separate internal document.

06.09 B  
2005

[www.piarc.org](http://www.piarc.org)



## LA GESTION DU PATRIMOINE POUR LES ROUTES UNE VUE D'ENSEMBLE

ASSET MANAGEMENT FOR ROADS  
AN OVERVIEW

Association  
mondiale  
de la Route



World Road  
Association

Comité technique AIPCR C6 Gestion des Routes  
PIARC Technical Committee C6 Road Management



Comité technique AIPCR C6 Gestion des Routes  
PIARC Technical Committee C6 Road Management

**LA GESTION DU PATRIMOINE POUR LES ROUTES  
UNE VUE D'ENSEMBLE**

**ASSET MANAGEMENT FOR ROADS  
AN OVERVIEW**

### *A propos de l'AIPCR*

« L'Association mondiale de la Route (AIPCR) est une association à but non lucratif fondée en 1909 pour favoriser la coopération internationale et les progrès dans le domaine de la route et du transport routier.

L'étude faisant l'objet de ce rapport a été définie dans le Plan stratégique 2004-2007 approuvé par le Conseil de l'AIPCR dont les membres sont des représentants des gouvernements nationaux membres. Les membres du Comité technique responsable de ce rapport ont été nommés par les gouvernements nationaux membres pour leurs compétences spécifiques.

Les opinions, constatations, conclusions et recommandations exprimées dans cette publication sont celles des auteurs et ne sont pas nécessairement celles de la société/organisme auquel ils appartiennent.

N° ISBN : XXXXXXXXXXXXX (à compléter par SG AIPCR)

Des exemplaires de ce rapport sont disponibles auprès de l'Association mondiale de la Route (AIPCR), La Grande Arche, Paroi nord, Niveau 5, 92055 La Défense cedex, France  
Internet: <http://www.piarc.org>

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### *Les auteurs*

### *Statements*

*The World Road Association (PIARC) is a nonprofit organisation established in 1909 to improve international co-operation and to foster progress in the field of roads and road transport.*

*The study that is the subject of this report was defined in the PIARC Strategic Plan 2004 – 2007 approved by the Council of the World Road Association, whose members and representatives of the member national governments. The members of the Technical Committee responsible for this report were nominated by the member national governments for their special competences.*

*Any opinions, findings, conclusions and recommendations expressed in this publication are those of the authors and do not necessarily reflect the views of their parent organizations or agencies.*

*International Standard Book Number xxxxxxxxxxxx (to be added by PIARC SG)*

*Copies of this report are available from the World Road Association (PIARC), La Grande Arche, Paroi nord, Niveau 5, 92055 La Défense cedex, France  
Internet: <http://www.piarc.org>*

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### *Authors statements*





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## RÉSUMÉ

Dans la plupart des pays, le réseau routier constitue l'un des plus importants patrimoines communautaires, et appartient essentiellement à l'État. Les personnes responsables de l'infrastructure doivent entretenir, exploiter, améliorer, remplacer et préserver ce patrimoine. En même temps, les ressources financières et humaines nécessaires pour atteindre les objectifs de performance du réseau routier sont souvent rares, et doivent être soigneusement gérées. Toutes ces tâches doivent être accomplies sous l'étroite surveillance de la population qui paye pour cet élément du système de transport du pays, qui en est un usager régulier, et qui exige de plus en plus des niveaux accrus de qualité sur le plan de la sécurité, de la fiabilité et du confort. Mais les réseaux routiers sont également un patrimoine physique constituant un puissant générateur de richesse économique et d'égalité sociale. En conséquence, les gouvernements font de plus en plus pression sur les Administrations Routières pour qu'elles améliorent l'efficacité.

Un travail important a été accompli ces dernières années dans le développement du concept de la Gestion du Patrimoine, avec en première ligne l'OCDE, l'AIPCR, et les administrations routières aux États-Unis, en Finlande et en Australasie. La US Federal Highway Administration a fondé un Bureau de Gestion du Patrimoine en 1999. Mais, à notre connaissance, aucun pays n'a encore mis en œuvre une structure de Gestion du Patrimoine complète, entièrement opérationnelle.

Nous souhaitons tout particulièrement étudier la manière dont la gestion du patrimoine peut être intégrée à une organisation, les nouvelles approches de communication pouvant être élaborées, et les nouvelles pratiques de gestion, les compétences et formation pouvant être nécessaires. Nous désirions également étudier les critères d'évaluation du patrimoine adoptés par les organisations, la nature de ce patrimoine, et le degré de détail de ces évaluations. Nous espérons pouvoir contribuer à une certaine cohérence qui, à son tour, aboutira à l'adoption d'une série cohérente d'indicateurs et à des opportunités plus accessibles de comparaison et d'étalonnage.

## EXECUTIVE SUMMARY

In most countries, the road network constitutes one of the largest community assets, and is predominantly government owned. Those responsible for the infrastructure must maintain, operate, improve, replace and preserve the asset. At the same time, the financial and human resources needed to achieve the performance objectives of the road network are often scarce, and must be managed carefully. All of this must be accomplished under the close scrutiny of the public who pay for this element of the country's transport system, are regular users of it, and who increasingly demand improved levels of quality in terms of safety, reliability and ride. But road networks are also physical assets that are powerful generators of economic wealth and social equity. As a result, governments are placing ever greater pressures on Road Administrations to improve the efficiency of, and accountability for, the management of the community's asset. (Asset Management For The Roads Sector – OECD 2000).

A very great deal of work has been done in recent years in developing the Asset Management concept. At the forefront have been OECD, PIARC, and road administrations in the United States, Finland and Australasia. The US Federal Highway Administration established an Office of Asset Management in 1999. But, as far as we know, no country has yet implemented a fully operational comprehensive Asset Management framework.

We have been particularly keen to investigate the way in which asset management can fit into an organisation, what new approaches to communication can be realised, and what new management practices, skills and training might be required. We also wanted to investigate on what basis organisations have been preparing valuations of their assets, which assets these were, and to what level of detail. Our hope is that we can help the achievement of some degree of consistency which, in turn, will lead to the adoption of a consistent set of indicators and more ready comparison and benchmarking opportunities.



## I N T R O D U C T I O N

DANS LA PLUPART DES PAYS, LE RÉSEAU ROUTIER CONSTITUE L'UN DES PLUS IMPORTANTS PATRIMOINES COMMUNAUTAIRES, ET APPARTIENT ESSENTIELLEMENT À L'ÉTAT. LES PERSONNES RESPONSABLES DE L'INFRASTRUCTURE DOIVENT ENTREtenir, EXPLOITER, AMÉLIORER, REMPLACER ET PRÉSERVER CE PATRIMOINE. EN MÊME TEMPS, LES RESSOURCES FINANCIÈRES ET HUMAINES NÉCESSAIRES POUR ATTEINDRE LES OBJECTIFS DE PERFORMANCE DU RÉSEAU ROUTIER SONT SOUVENT RARES, ET DOIVENT ÊTRE SOIGNEUSEMENT GÉRÉES. TOUTES CES TÂCHES DOIVENT ÊTRE ACCOMPLIES SOUS L'ÉTROITE SURVEILLANCE DE LA POPULATION QUI PAYE POUR CET ÉLÉMENT DU SYSTÈME DE TRANSPORT DU PAYS, QUI EN EST UN USAGER RÉGULIER, ET QUI EXIGE DE PLUS EN PLUS DES NIVEAUX ACCRUS DE QUALITÉ SUR LE PLAN DE LA SÉCURITÉ, DE LA FIABILITÉ ET DU CONFORT. MAIS LES RÉSEAUX ROUTIERS SONT ÉGALEMENT UN PATRIMOINE PHYSIQUE CONSTITUANT UN PUISSANT GÉNÉRATEUR DE RICHESSE ÉCONOMIQUE ET D'ÉGALITÉ SOCIALE. EN CONSÉQUENCE, LES GOUVERNEMENTS FONT DE PLUS EN PLUS PRESSION SUR LES ADMINISTRATIONS ROUTIÈRES POUR QU'ELLES AMÉLIORENT L'EFFICACITÉ.

## I N T R O D U C T I O N

IN MOST COUNTRIES, THE ROAD NETWORK CONSTITUTES ONE OF THE LARGEST COMMUNITY ASSETS, AND IS PREDOMINANTLY GOVERNMENT OWNED. THOSE RESPONSIBLE FOR THE INFRASTRUCTURE MUST MAINTAIN, OPERATE, IMPROVE, REPLACE AND PRESERVE THE ASSET. AT THE SAME TIME, THE FINANCIAL AND HUMAN RESOURCES NEEDED TO ACHIEVE THE PERFORMANCE OBJECTIVES OF THE ROAD NETWORK ARE OFTEN SCARCE, AND MUST BE MANAGED CAREFULLY. ALL OF THIS MUST BE ACCOMPLISHED UNDER THE CLOSE SCRUTINY OF THE PUBLIC WHO PAY FOR THIS ELEMENT OF THE COUNTRY'S TRANSPORT SYSTEM, ARE REGULAR USERS OF IT, AND WHO INCREASINGLY DEMAND IMPROVED LEVELS OF QUALITY IN TERMS OF SAFETY, RELIABILITY AND RIDE. BUT ROAD NETWORKS ARE ALSO PHYSICAL ASSETS THAT ARE POWERFUL GENERATORS OF ECONOMIC WEALTH AND SOCIAL EQUITY. AS A RESULT, GOVERNMENTS ARE PLACING EVER GREATER PRESSURES ON ROAD ADMINISTRATIONS TO IMPROVE THE EFFICIENCY OF, AND ACCOUNTABILITY FOR, THE MANAGEMENT OF THE COMMUNITY'S ASSET. (ASSET MANAGEMENT FOR THE ROADS SECTOR – OECD 2000).

Un travail important a été accompli ces dernières années dans le développement du concept de la Gestion du Patrimoine, avec en première ligne l'OCDE, l'AIPCR, et les administrations routières aux États-Unis, en Finlande et en Australasie. La US Federal Highway Administration a fondé un Bureau de Gestion du Patrimoine en 1999. Mais, à notre connaissance, aucun pays n'a encore mis en œuvre une structure de Gestion du Patrimoine complète, entièrement opérationnelle.

### L'objectif du présent rapport est triple :

- a) résumer brièvement la signification de la Gestion du Patrimoine;
- b) résumer les progrès effectués à travers le monde dans la mise en œuvre de ce type de dispositions; et
- c) se focaliser sur certains aspects spécifiques de la Gestion du Patrimoine qui, nous l'espérons, pourraient aider ceux qui envisagent une mise en œuvre ou ceux qui en sont aux premières phases de développement.

Nous souhaitons tout particulièrement étudier la manière dont la gestion du patrimoine peut être intégrée à une organisation, les nouvelles approches de communication pouvant être élaborées, et les nouvelles pratiques de gestion, les compétences et formation pouvant être nécessaires. Nous désirions également étudier les critères d'évaluation du patrimoine adoptés par les organisations, la nature de ce patrimoine, et le degré de détail de ces évaluations. Nous espérons pouvoir contribuer à une certaine cohérence qui, à son tour, aboutira à l'adoption d'une série cohérente d'indicateurs et à des opportunités plus accessibles de comparaison et d'étalonnage.

A very great deal of work has been done in recent years in developing the Asset Management concept. At the forefront have been OECD, PIARC, and road administrations in the United States, Finland and Australasia. The US Federal Highway Administration established an Office of Asset Management in 1999. But, as far as we know, no country has yet implemented a fully operational comprehensive Asset Management framework.

### The purpose of this report is threefold:

- a) to briefly summarise what Asset Management means;
- b) to summarise what progress is being made around the world in implementing such arrangements; and
- c) to focus on some specific aspects of Asset Management which we hope might assist those still considering implementation or those who are in the early stages of development.

We have been particularly keen to investigate the way in which asset management can fit into an organisation, what new approaches to communication can be realised, and what new management practices, skills and training might be required. We also wanted to investigate on what basis organisations have been preparing valuations of their assets, which assets these were, and to what level of detail. Our hope is that we can help the achievement of some degree of consistency which, in turn, will lead to the adoption of a consistent set of indicators and more ready comparison and benchmarking opportunities.



Nous avons tiré nos informations d'une part d'études préalablement publiées comme par l'OCDE et d'autre part d'ouvrages récemment publiés par les administrations routières aux États-unis, en Australie, au Canada, et en Finlande. Le comité a également recueilli des données extrêmement utiles. Début 2000, nous avons distribué un questionnaire détaillé auquel nous avons reçu plus de 40 réponses en provenance du monde entier. Un résumé de ces réponses figure à l'**Annexe 1**. Nous tenons à profiter de l'occasion pour remercier toutes les personnes qui ont contribué au présent rapport. Nous souhaiterions également remercier nos collègues de l'AIPCR, du C6 et d'autres comités techniques, pour les informations supplémentaires et l'assistance générale qu'ils nous ont apportées.

Le présent rapport est destiné à l'ensemble des membres de l'AIPCR et reconnaît que les pays membres respectifs sont à différents stades de développement eu égard à leur méthode de gestion routière.

À ce titre, le rapport traite du concept général d'une approche de gestion complète, la **Figure 1** illustrant comment ce concept peut se traduire par un processus de définition de la stratégie d'investissement appropriée en fonction de divers objectifs de performance, états du patrimoine et alternatives de financement. La **Figure 2** montre les composants généraux employés par la plupart des juridictions, implicitement ou explicitement, au niveau des projets ou des systèmes, pour déterminer les travaux devant ou pouvant être mis en œuvre :

- les objectifs, ou mesures des performances, sont d'abord déterminés ;
- l'état et la valeur du réseau routier, sur une portion ou à l'échelle du réseau, sont définis. L'état peut être l'état physique de la route et/ou les performances du système routier ;
- des solutions de rechange sont élaborées et évaluées ;
- une analyse de compromis entre les différentes solutions est conduite, et des stratégies d'investissement sont élaborées en fonction des mécanismes de financement disponibles.

Les pays membres de l'AIPCR seront à différents stades de développement et sophistication en ce qui concerne leur approche de la gestion routière, et auront différents besoins à l'avenir, en fonction des attentes des usagers, des objectifs et priorités du gouvernement, de l'état actuel du système, des capacités en ressources techniques, et des capacités économiques et de financement. Tandis que le présent rapport tente par conséquent d'aborder les questions et facteurs associés à une approche de gestion du patrimoine complète, il convient que les différentes juridictions adoptent des composants individuels correspondant à leur environnement respectif.

We have drawn our information in part from previously published research by, for example, OECD, and in part from recently published work by Road Administrations in the US, Australia, Canada, and Finland. But we have also collected much useful data ourselves. Early in 2000 we issued a detailed questionnaire and were very pleased to receive over 40 responses from all over the world. A summary of these responses is at **Appendix 1**. We would like to take this opportunity to thank those who helped us in this way. We would also like to acknowledge the additional information, and general support, we have received from PIARC colleagues, both in C6 and other technical committees.

This report is intended for the broader membership of PIARC and recognizes that the respective member countries are at various stages in development with respect to how they manage their roads.

As such the report deals with the overall concept of a comprehensive management approach, with **Figure 1** providing an example of how this concept may translate into a process for determining the appropriate investment strategy in relation to various performance objectives, asset conditions and funding alternatives. **Figure 2** illustrates the general components that most jurisdictions employ, implicitly or explicitly, either at a project level or a system level, to determine what work should or can be implemented:

- The objectives, or performance measures are first determined.
- The condition and the capital value of the road network, either on a section or network level, are established. Condition could be the physical condition of the road and/or the performance of the road system.
- Alternative remedies are developed and evaluated.
- A trade-off analysis between the alternatives is carried out, and investment strategies are developed in relation to available funding mechanisms.

PIARC member countries will be at various stages of development and sophistication with respect to their approach to road management, and will have different needs in the future; depending on user expectations, government objectives and priorities, current system conditions, technical resources capabilities, and economical and funding capacities. While this report therefore attempts to discuss the features and considerations associated with a comprehensive asset management approach, it is appropriate that the various jurisdictions adopt individual components that will be relevant to their respective environment.

La **Figure 3** illustre la structure de gestion du patrimoine stratégique au sein de laquelle les juridictions peuvent sélectionner leurs priorités pour améliorer leur approche de la gestion routière. Une juridiction particulière peut choisir de se concentrer sur des réformes administratives en termes de changements organisationnels ou accords de sous-traitance. D'autres peuvent souhaiter se concentrer sur la mise en œuvre d'outils spécifiques, tels que des systèmes de gestion des chaussées, des systèmes de gestion des ponts, et des mesures des performances du patrimoine efficaces. Une meilleure définition des objectifs du propriétaire et une meilleure connaissance des besoins et degrés de satisfaction des usagers peuvent être prioritaires dans certains pays. Enfin, certaines juridictions peuvent choisir d'adopter différentes procédures de détermination des coûts et alternatives de financement. Quelles que soient les priorités, et la sélection des composants dont la mise en œuvre est envisagée, les approches adoptées sont mieux déterminées dans le contexte d'une structure de gestion du patrimoine stratégique qui permettra l'intégration future des éléments respectifs et offrira la possibilité d'incorporer des fonctions et processus de gestion du patrimoine additionnels en fonction de l'évolution des besoins et des orientations, au fur et à mesure de leur développement au sein des différentes juridictions.

**Figure 3**, overleaf, illustrates the strategic asset management framework within which jurisdictions may select their priorities for improving their approach to road management. A particular jurisdiction may select to concentrate on administrative reforms in terms of organizational changes or contracting-out arrangements. Others may wish to concentrate on implementation of specific tools, such as pavement management systems, bridge management systems, and effective asset performance measures. Better definition of the owner's objectives and understanding of users' needs and satisfaction levels may be a high priority in some countries. Finally, some jurisdictions may choose to pursue different costing procedures and funding alternatives. Regardless of priorities, and selection of components considered for implementation, the adopted approaches are best determined in the context of a strategic asset management framework which will allow for future integration of the respective elements and for flexibility to incorporate additional asset management features and processes in accordance with changing needs and directions, as they develop in the various jurisdictions.

## 1. QU'EST-CE QUE LA GESTION DU PATRIMOINE ?

«Un processus systématique d'entretien, de modernisation et d'exploitation du patrimoine, associant des principes d'ingénierie à des pratiques commerciales et une justification économique solides, et de fourniture d'outils pour encourager une approche plus organisée et flexible de prise des décisions nécessaires pour répondre aux attentes de la population.»

La gestion du patrimoine est en fait l'institutionnalisation d'une approche de type commercial (culture) de la gestion de l'infrastructure. Cela implique :

- percevoir les projets et programmes comme des investissements pour des clients spécifiques ;
- surveiller les performances et la valeur du patrimoine pour substituer des alternatives de projet et investissements ; et
- élaborer des stratégies d'investissement à court et long termes solides et compétitives pour le patrimoine actuel et futur.

Il est facile d'envisager qu'une structure de gestion du patrimoine comprendrait des informations sur les ponts et les chaussées et, si on leur demandait, la plupart des gens pourraient également citer les trottoirs et les pistes cyclables, les tunnels, les ponceaux et autres ouvrages. En insistant, certains pourraient également

## 1. WHAT IS ASSET MANAGEMENT?

“A systematic process of maintaining, upgrading and operating assets, combining engineering principles with sound business practice and economic rationale, and providing tools to facilitate a more organised and flexible approach to making the decisions necessary to achieve the public's expectations.”

Asset management is basically the institutionalising of a business-like approach (culture) to managing infrastructure. This implies:

- looking at projects and programmes as investments for specific customers;
- monitoring asset performance and value in order to trade-off project alternatives and investments; and
- developing sound and competitive short and long-term investment strategies for current and future assets.

It is easy to envisage that an asset management framework would include information about road pavements and bridges and, if asked, most might also mention footways and cycle tracks, tunnels, culverts and other structures. If pressed, some might see the benefits of including street furniture, fencing, etc. But what about



juger avantageux d'inclure le mobilier urbain, les palissades, etc. Qu'en est-il de l'équipement et des véhicules, des installations et matériels appartenant à une administration routière ? Des ressources humaines, des données, des procédures, et des connaissances investies ? Le tout fait partie du «patrimoine» de l'organisation, et les structures de gestion du patrimoine les plus complètes les engloberaient tous. En principe, il est toutefois important d'éviter d'avoir tendance à inclure uniquement le patrimoine visible, et le patrimoine suscitant le plus d'attention (réclamations) du public, tout en négligeant celui qui, bien qu'invisible (ex. systèmes de drainage), pourrait avoir un impact majeur sur la maximisation du rapport qualité-prix obtenu par un large éventail d'autres éléments de patrimoine.

La gestion du patrimoine touche dans une certaine mesure toutes les parties d'une organisation, ainsi que les partenaires, dépositaires d'enjeux et clients de l'organisation. En tant que nouvelle approche de type commercial, la gestion du patrimoine doit s'appliquer à toutes les unités commerciales d'une organisation, réajustant ou supplantant les anciennes pratiques, procédures et politiques. La portée de la gestion du patrimoine au sein d'une organisation doit englober :

- la planification stratégique ;
- l'évaluation et l'analyse des performances ;
- la génération et l'évaluation de solutions de rechange ;
- les stratégies et la programmation d'investissement ;
- la planification des activités et l'acquisition de financement ;
- les phases d'ingénierie et de conception ;
- la construction et la mise en œuvre ;
- l'exploitation et la maintenance ;
- la surveillance et le marketing.

## 2. POURQUOI LA GESTION DU PATRIMOINE EST-ELLE NÉCESSAIRE ?

L'objectif d'ensemble de l'adoption d'une approche de gestion du patrimoine est de pouvoir démontrer une gérance prudente du patrimoine. Cette nécessité peut être divisée en deux catégories : besoins organisationnels généraux et besoins des décideurs clés.

### 2.1. BESOINS ORGANISATIONNELS GÉNÉRAUX

Pour mener à bien sa mission, une organisation de transports a les exigences suivantes :

- elle doit disposer d'un inventaire complet de l'ensemble du patrimoine et d'un registre complet des autres attributs non physiques tels que limitations de vitesse, zones de salage, zones d'intérêt environnemental, etc. ;

equipment and vehicles, and plant and materials owned by a road administration? And what about human resources, data, procedures, and invested knowledge? These are all 'assets' of the organisation, and the most comprehensive of asset management frameworks would encompass all of these. Principally, however, it is important to avoid the tendency to include only the visible assets, and those receiving most attention (complaints) from the public, while neglecting those that, whilst out of sight (e.g. drainage systems), could affect very significantly the maximisation of value for money achieved from a broad range of other assets.

Asset management touches all parts of an organisation to some degree, as well as the organisation's partners, stakeholders and its customers. As a new business-like approach, asset management needs to spread to all business units in an organisation, retrofitting or displacing old practices, procedures and policies. The breadth of asset management in an organisation should span:

- strategic planning;
- performance assessment and analysis;
- alternative generation and evaluation;
- investment strategies and programming;
- business planning and funding acquisition;
- engineering and design phases;
- construction and implementation;
- operations and maintenance;
- monitoring and marketing.

## 2. WHY DO WE NEED ASSET MANAGEMENT?

The overall objective of adopting an asset management approach is to be able to demonstrate prudent stewardship of the assets. The need can be separated into two categories: general organizational needs and the needs of key decision-makers.

### 2.1. GENERAL ORGANIZATIONAL NEEDS

For the appropriate fulfilment of its mandate, a transportation organisation has the following requirements:

- Need to have a complete inventory of all assets and a complete record of other, non-physical, attributes such as speed limits, salting areas, areas of environmental interest, etc;

### 2.1.1 Australie

#### Austrroads

Austrroads a réexaminé sa Structure de Gestion du Patrimoine et ceci résume dans l'ensemble les approches actuelles des autorités membres. La structure HDM-4 est utilisée pour garantir la cohérence de l'évaluation des initiatives de maintenance. Des valeurs par défaut pour les coûts d'exploitation des véhicules, les taux d'accidents et les coûts ont été développés. Austrroads a également publié des rapports sur la mesure standard de la rugosité et de l'orniérage. Des mesures des fissurations et de la solidité des chaussées sont prévues.

#### Department of Main Roads, Queensland (Ministère des Routes nationales)

Le DMR Queensland développe actuellement une Structure de Gestion du Patrimoine à un niveau stratégique, tactique et opérationnel. Cette structure, qui correspond à la structure Austrroads, englobera tous les aspects de l'investissement dans le patrimoine: grands travaux, maintenance et exploitation.

Le DMR Queensland a récemment publié des «Directives de Maintenance du Patrimoine». L'idée maîtresse de ces directives est de favoriser l'application pratique des principes de gestion du patrimoine dans le contexte de la structure de gestion, des procédures administratives, et de l'environnement d'exploitation d'ensemble du DMR Queensland.

Les Directives devraient constituer le premier point de référence pour le personnel de gestion du patrimoine au sein des bureaux de district et régionaux. Les Directives contiennent des Sections distinctes sur la gestion environnementale, la gestion des degrés de congestion des routes, la maintenance des chaussées, la maintenance des ponts, la maintenance du mobilier routier, la maintenance des systèmes de transport intelligents, la maintenance des systèmes de drainage, la maintenance des zones de circulation, et un glossaire complet.

Les Directives du DMR Queensland sont disponibles par voie électronique sur le site : [www.mainroads.qld.gov.au](http://www.mainroads.qld.gov.au).

#### The Roads Corporation of Victoria (Vicroads)

Et de Victoria a récemment publié sa Stratégie de Maintenance du Patrimoine Routier. Ce document présente une structure de gestion du patrimoine routier et vient compléter la stratégie de chaussées «prudente» et la stratégie de ponts de Et de Victoria. La Stratégie de Gestion du Patrimoine Routier englobe inventaire routier, données sur l'état, recherche et développement, et gestion des risques.

### 2.1.1 Australia

#### Austrroads

Austrroads has reviewed its Framework for Asset Management and this generally summarizes the current approaches of the member authorities. The HDM-4 framework is being used to provide consistency in evaluation of maintenance effort. Default values for vehicle operating costs, crash rates and costs have been developed. Austrroads has also published reports on standard measurement of roughness and rutting. Cracking and pavement strength are to follow.

#### Department of Main Roads, Queensland

DMR Queensland is developing an Asset Management Framework at a strategic, tactical and operational level. This framework, which is consistent with the Austrroads framework, will cover all aspects of asset investment: capital works, maintenance and operations.

DMR Queensland has recently issued «Asset Maintenance Guidelines». The thrust of these is to support the practical application of the principles of asset management in the context of DMR Queensland's management structure, administrative procedures, and overall operating environment.

The Guidelines are intended as a first point of reference for asset management personnel in District and Regional Offices. The Guidelines contain separate Parts on environmental management, overloading management, pavement maintenance, bridge maintenance, road furniture maintenance, ITS maintenance, drainage maintenance, road reserve maintenance, and an extensive glossary of terms.

The DMR Queensland Guidelines are available electronically from:  
[www.mainroads.qld.gov.au](http://www.mainroads.qld.gov.au).

#### The Roads Corporation of Victoria (Vicroads)

Victoria has recently published its Roadside Asset Maintenance Strategy. This document provides a framework for management of roadside assets and complements the «stitch-in-time» pavement strategy and Victoria's bridges strategy. The Roadside Asset Management Strategy covers roadside inventory, condition data, research and development and risk management.