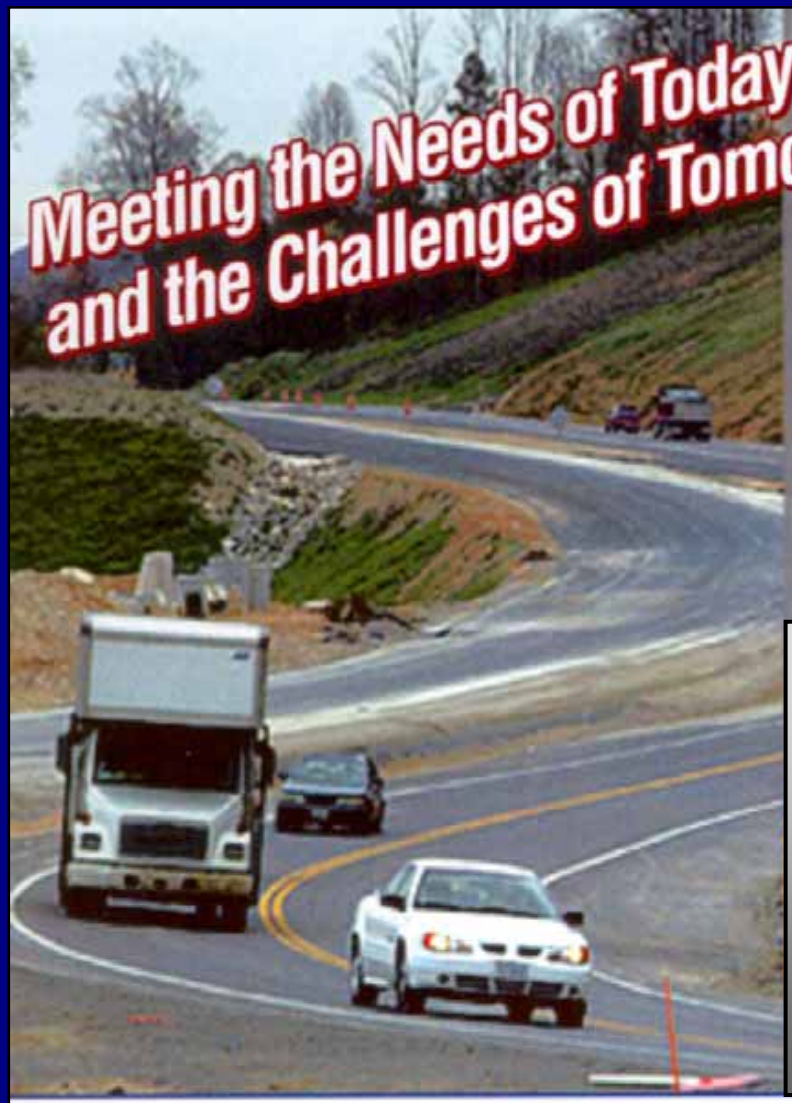


07

NATIONAL PAVEMENT MANAGEMENT CONFERENCE

MAY 6-9, 2007

SHERATON NORFOLK WATERSIDE HOTEL, NORFOLK, VA

FUTURE OF PAVEMENT MANAGEMENT SYSTEMS

By

Ralph Haas

U.S. Department of Transportation
Federal Highway Administration

Virginia Tech Transportation Institute

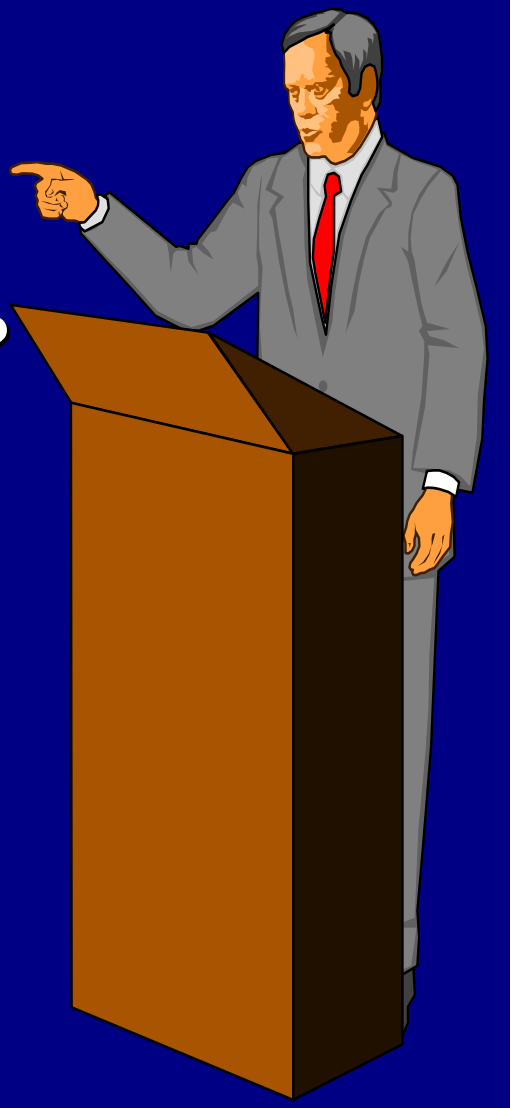
VTRC Virginia Transportation Research Council

VDOT Virginia Department of Transportation

TRB

PRESENTATION

- Why the future is important
- Is the past relevant to the future ?
- Future prospects (likely, uncertain and wishful thinking) – Examples
- Ideal PMS of the future



WHY IS THE FUTURE IMPORTANT

….. have to build, renew, maintain and manage an infrastructure which can support economic development ….. preserve our quality of life ….. requires search for new and better technologies and processes ….. can be realized in large part by creative individuals, innovation and adequate resources.

ASCE

2005 Report Card for America's Infrastructure

Aviation	D+
Bridges	C
Dams	D
Drinking Water	D-
Energy	D
Hazardous Waste	D
Navigable Waterways	D-
Public Parks and Recreation	C-
Rail	C-
Roads	D
Schools	D
Security	I
Solid Waste	C+
Transit	D+
Wastewater	D-

America's Infrastructure GPA = D

Total Investment Needs = $1.6 Trillion (estimated 5 year need)

www.infrastructure reportcard.org

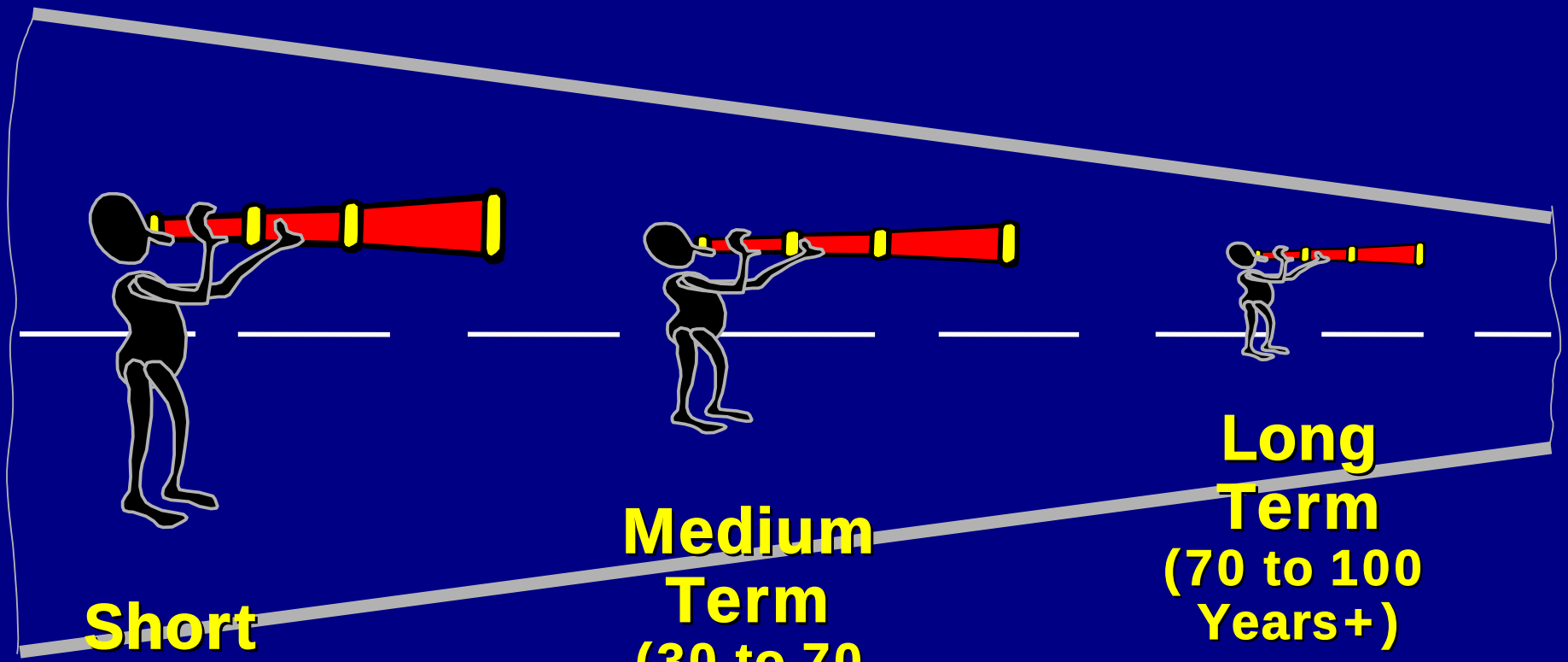
WE NEED

- Adequate Financing
- Good Management
- Best Technologies
- Security
- Environmental Protection
- Succession Planning

AND

Relevant Teaching, Training and Research

TIME HORIZON FOR THE FUTURE

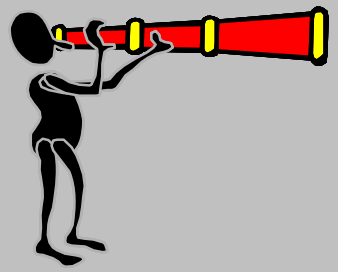


Short Term (10 to 30 Years)

Medium Term (30 to 70 Years)

Long Term (70 to 100 Years+)

CIVIL INFRASTRUCTURE PROSPECTS

FUTURE	REASONABLE CERTAINTY	UNCERTAIN
Medium Term 	• Need for clean water • Continued urban growth • Continued need for effective waste treatment / disposal • Globalization of technology • Continued need to transport materials and goods • "Super materials"	• Use of quantum computing? • Population growth levels off? • Start of infr. on Mars? • Widespread tele-commuting? • Less transport of people? • Decreased use of petroleum? • Glob. of water market?

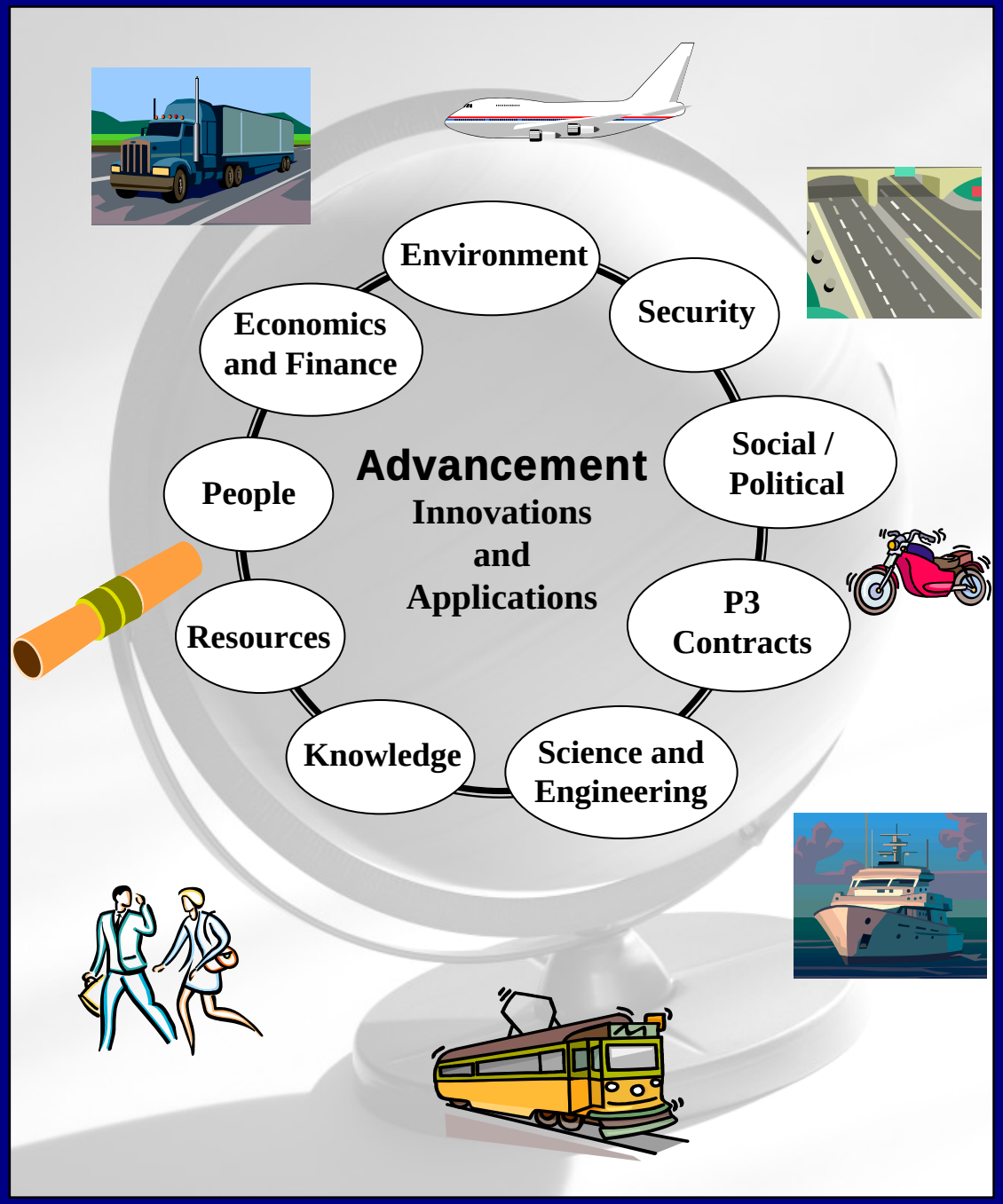
FUTURE OF PAVEMENT MANAGEMENT

Does it Have a Future?

Overriden By Asset Management ?

Distinct System But Integrated and Continuing Improvements

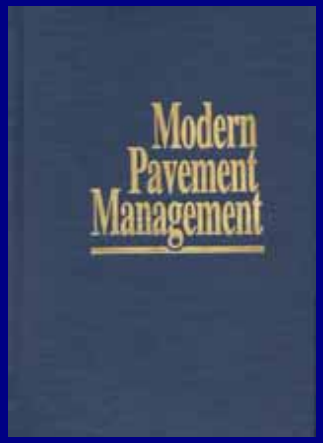
What Will It Look Like ??



DRIVING FORCES BEHIND THE FUTURE OF PAVEMENT MANAGEMENT SYSTEMS

EVOLUTION

1970's ..... Pavement Management
1980's ..... Bridge Management
1990's ..... Asset Management



⇓

Why !

⇓

Private sector business principles for managing public assets

But: Private sector ⟷ profit motive
Public sector ⟷ many objectives and demands

Result: Adjustments are not simple or straightforward

Today

Tomorrow ?

Asset Management Systems Inc.

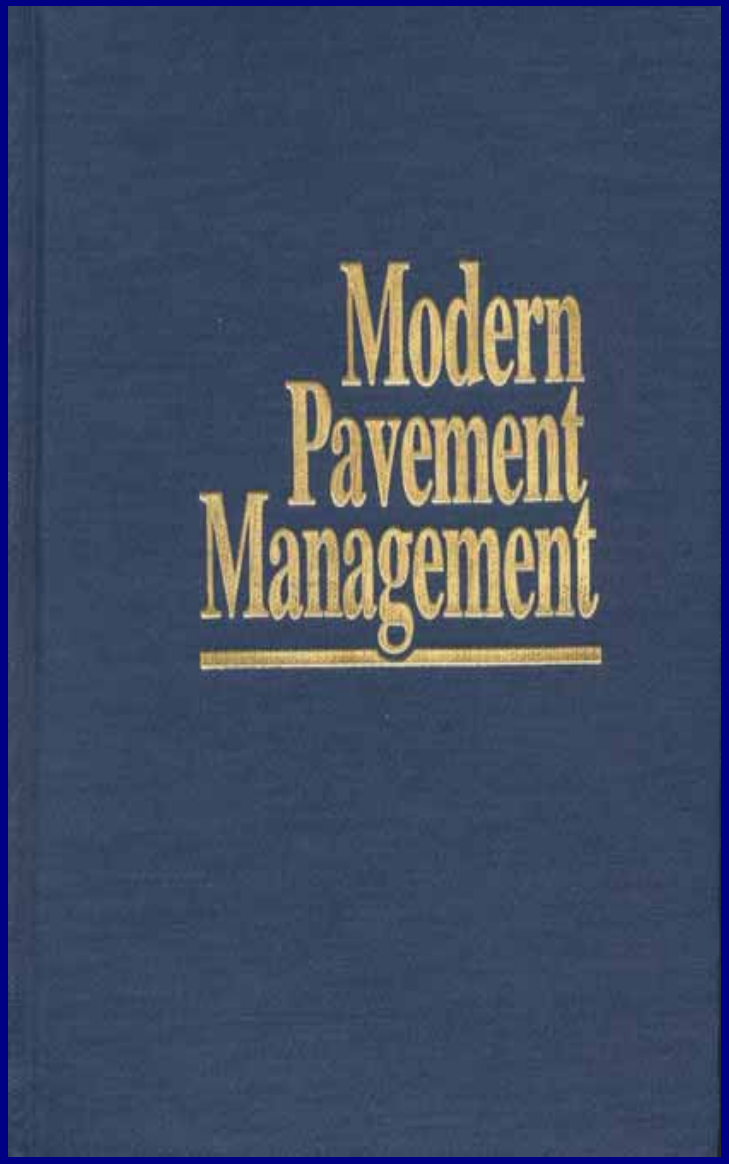
Who Drives Now?

??

?

??

PAVEMENT MANAGEMENT SUCCESSES ?



Depend On

- Commitment
- Understanding the Technology
- Serving Users
- Application Levels
- Succession Planning
- Resources
- Data

PMS IMPROVEMENT NEEDS (Circa 2000)

1. Institutional

- Succession Planning

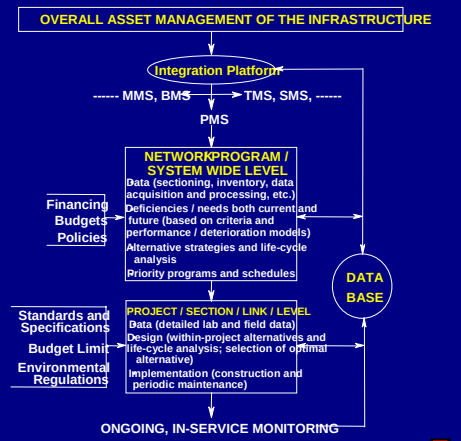
- Integrating PMS with Asset Management

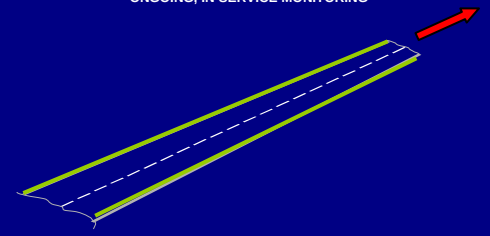
- Adapting PMS to Privatization

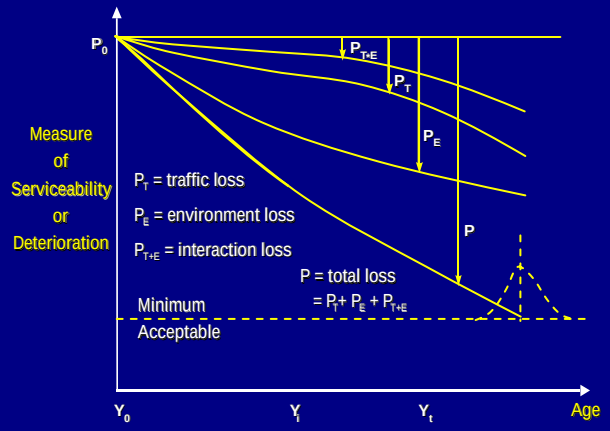
PMS IMPROVEMENT NEEDS (Circa 2000)

2. Technical

- Interfacing Network and Project Levels
- Longer Lasting, Better Quality Pavements
- Performance Models Which Separate Traffic and Environment Effects

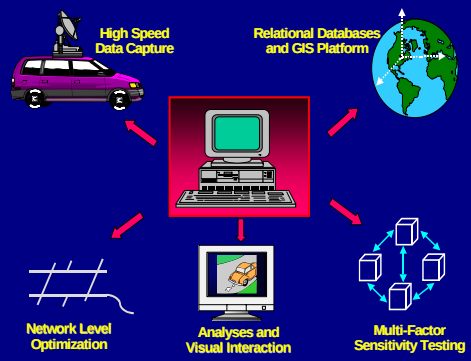






PMS IMPROVEMENT NEEDS (Circa 2000)

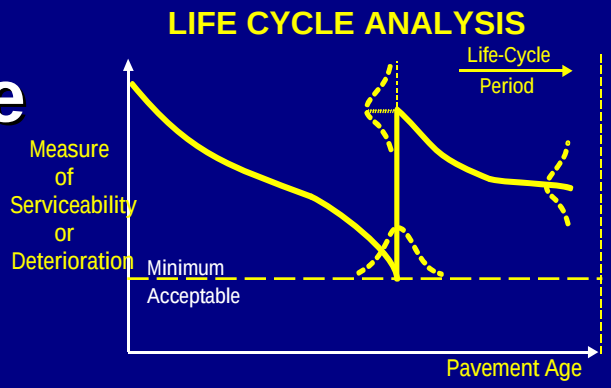
3. Economic and Life Cycle



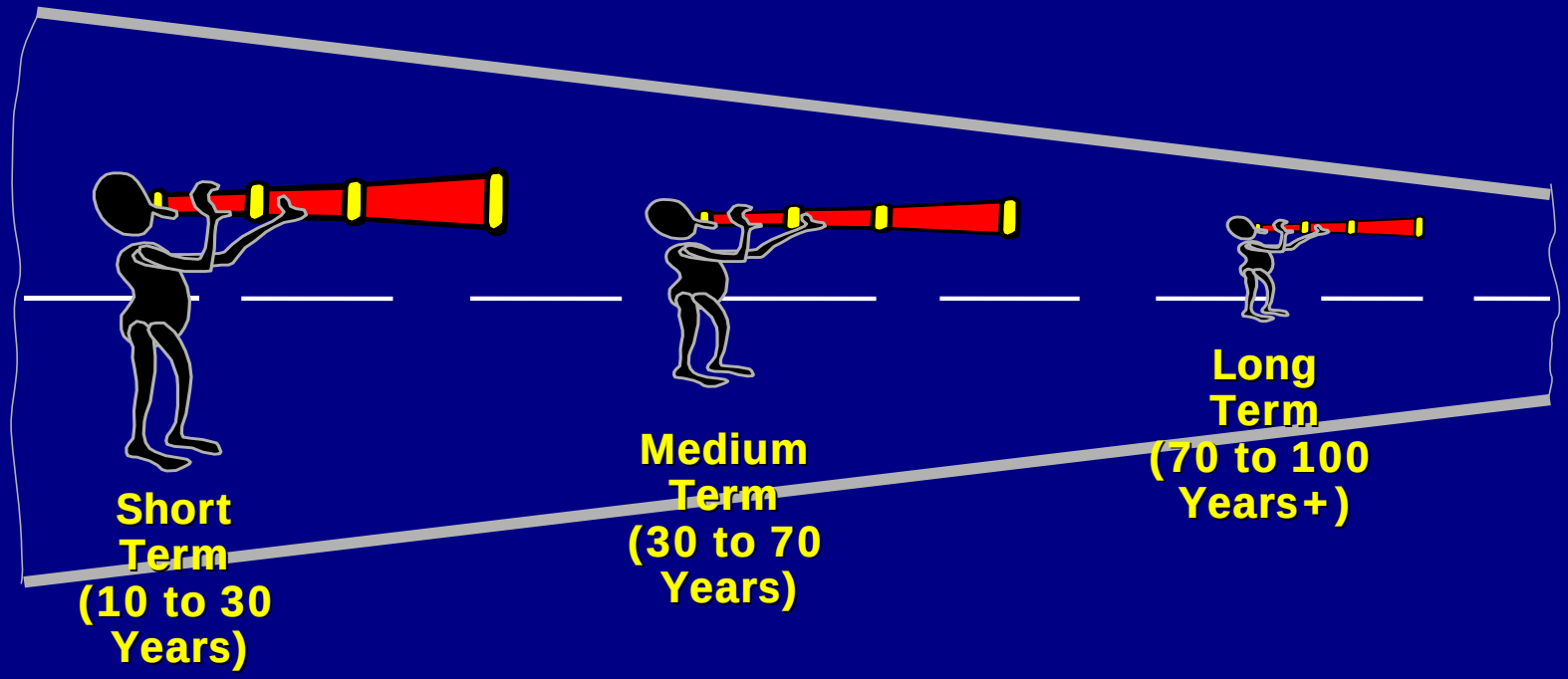
- Quantifying Benefits
- Incentive Programs

$

- Very Long Term Life Cycle Analysis Protocols



FUTURE OF PAVEMENT MANAGEMENT ?



SHORT TERM FUTURE PROSPECTS

Prospect	Likely	Uncertain	Wishful Thinking
● Extensive web-based availability of data and information	Yes	No	No
● Explicit requirements for reporting asset value	Yes	No	No
● Explicit policy objectives tied to measurable performance indicators and implementation targets	?	Yes	No

SHORT TERM FUTURE PROSPECTS

(Continued)

Prospect	Likely	Uncertain	Wishful Thinking
● Comprehensive integration platform tying "silos" together	?	Yes	No
● More P3's in long term network contracts	Yes	Yes	No
● Incorp. climate change, resource conservation, noise, etc. into PMS	?	Yes	No
● Substantive tech. advances ("Smart" pavements, nanotech. application, etc.)	Yes	No	No

SHORT TERM FUTURE PROSPECTS

(Continued)

Prospect	Likely	Uncertain	Wishful Thinking
• Widespread protocols for valuing PMS's, data bases, risk exposure, etc.	No	Yes	?
• Comprehensive succession planning (people, knowledge and technology)	No	Yes	Yes
• Adequate research funding to advance PMS	No	Yes	Yes
• Clear recognition and encouragement of the leaders of tomorrow	No	Yes	?

7th International Conference on Managing Pavement Assets

ICMPA

CALGARY, CANADA 2008

"Preserving what we have ...
Investing in our future ...
Finding the balance".

June 25th -28th 2008 - Westin Hotel, Calgary, Alberta, Canada

The Conference Will Include "THE CHALLENGE"

PROUDLY SPONSORED BY

Alberta Infrastructure and Transportation

University of Calgary

Welcome to the 7th International Conference on Managing Pavement Assets !

Investment Analysis and Communication Challenge for Road Assets

7th International Conference on Managing Pavement Assets
ICMPA
CALGARY, CANADA 2008

CHALLENGE
Terms of Reference

- Introduction and Scope (demonstration of good practices; emphasis on communication)
- Network Description (1293 pavement sections in 2 road classes, 161 bridges, 356 culverts, 45 major signs) and Data Files
- Treatments, Service, Lives, Unit Costs, Vehicle Types and Volumes, IRI models, VOC's, etc.

7th International Conference on Managing Pavement Assets
ICMPA
CALGARY, CANADA 2008

INSTITUTIONAL EXPECTATIONS

Policy Objectives

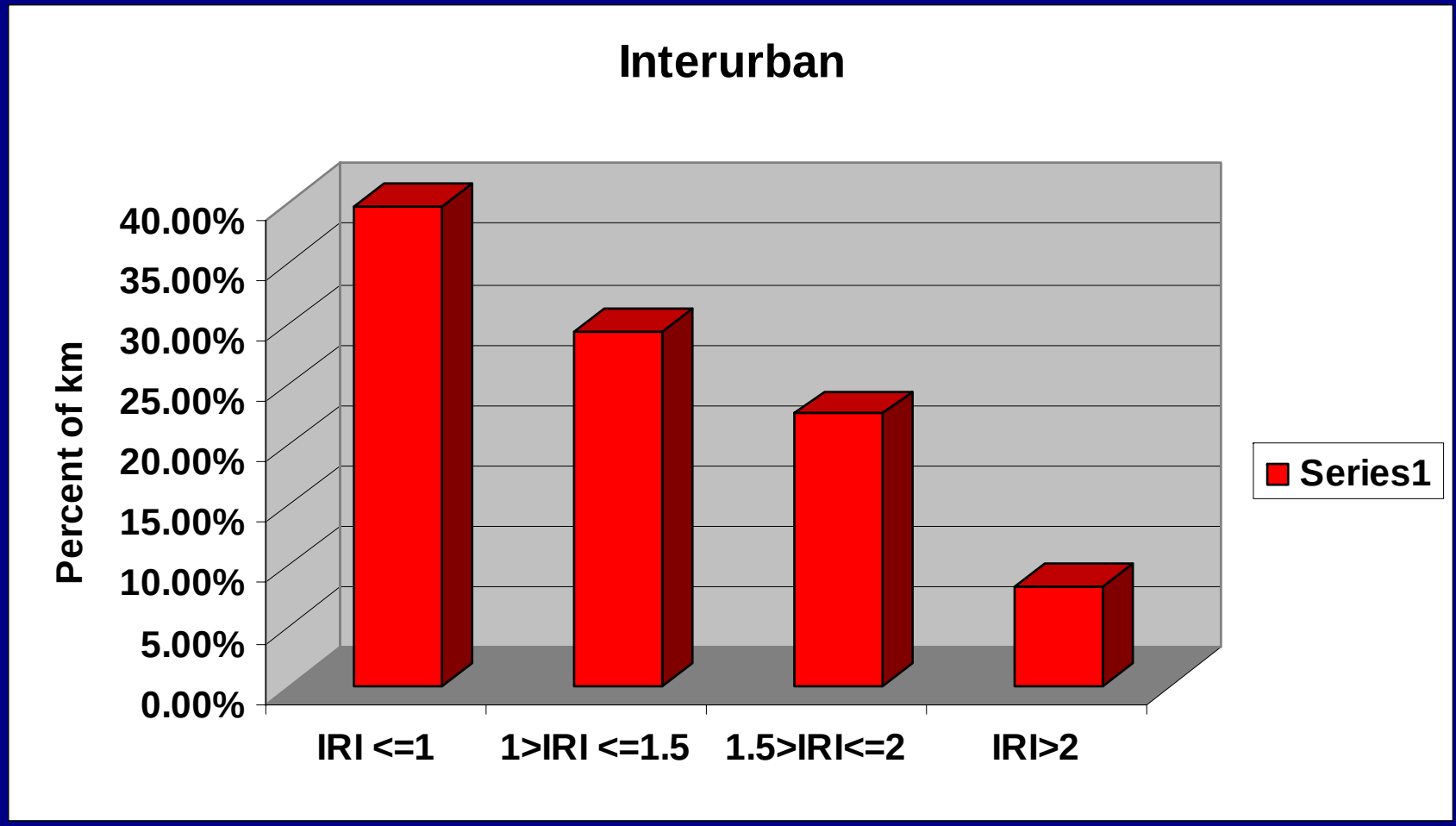
- Quality of Service to Users
- Safety Goals
- Preservation of Investment
- Productivity and Efficiency
- Cost Recovery
- Research and Training
- Communication With Stakeholders
- Resource Conservation and Environmental Protection

With Measureable Performance Indicators and Quantified Implementation Targets

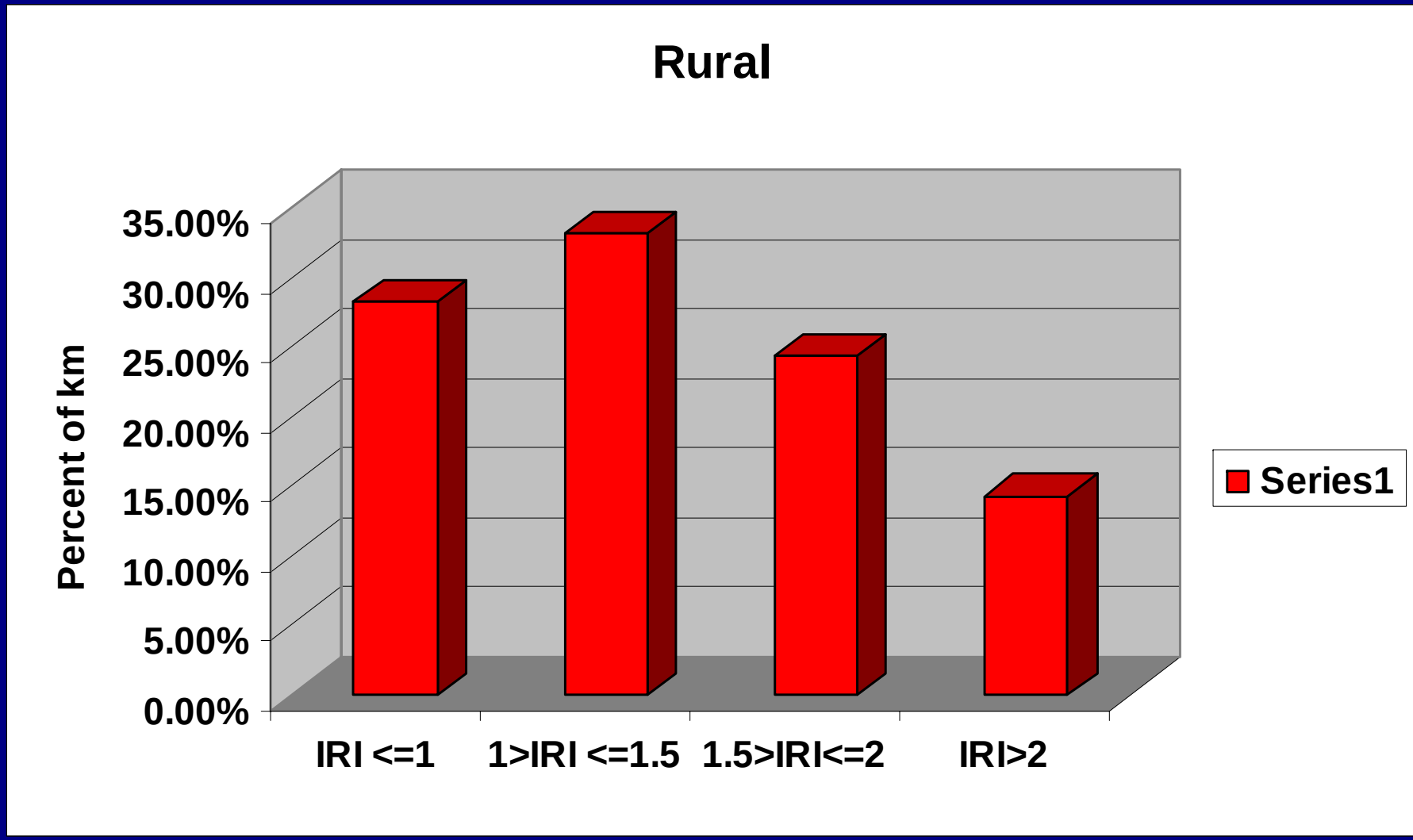
EXAMPLES

Policy Objective	Performance Indicator	Implementation Target
Quality of Service to Users	• Network smoothness (% good, fair or poor) • Annual user costs ($/km) • Provision of mobility (ave. speed by road class)	• 90% + fair or better • Increase ≤ CPI • > 50% speed limit
Safety Goals	• Accident reductions (%)	• Fatalities and injuries by ≥ 1% annually
Preservation of Investment	• Asset value of road network ($)	• Increase of ≥ 0.5% annually

INTERURBAN NETWORK
(The “Challenge”)

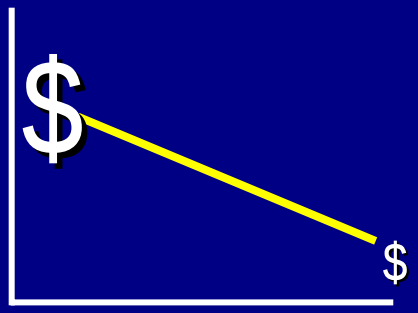


RURAL NETWORK
(The “Challenge”)

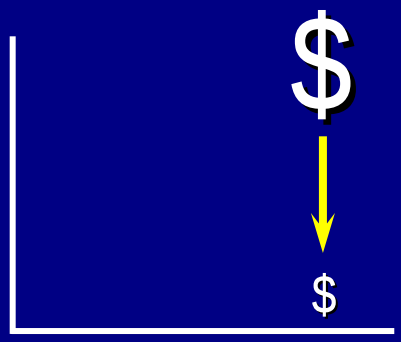


ASSET VALUATION

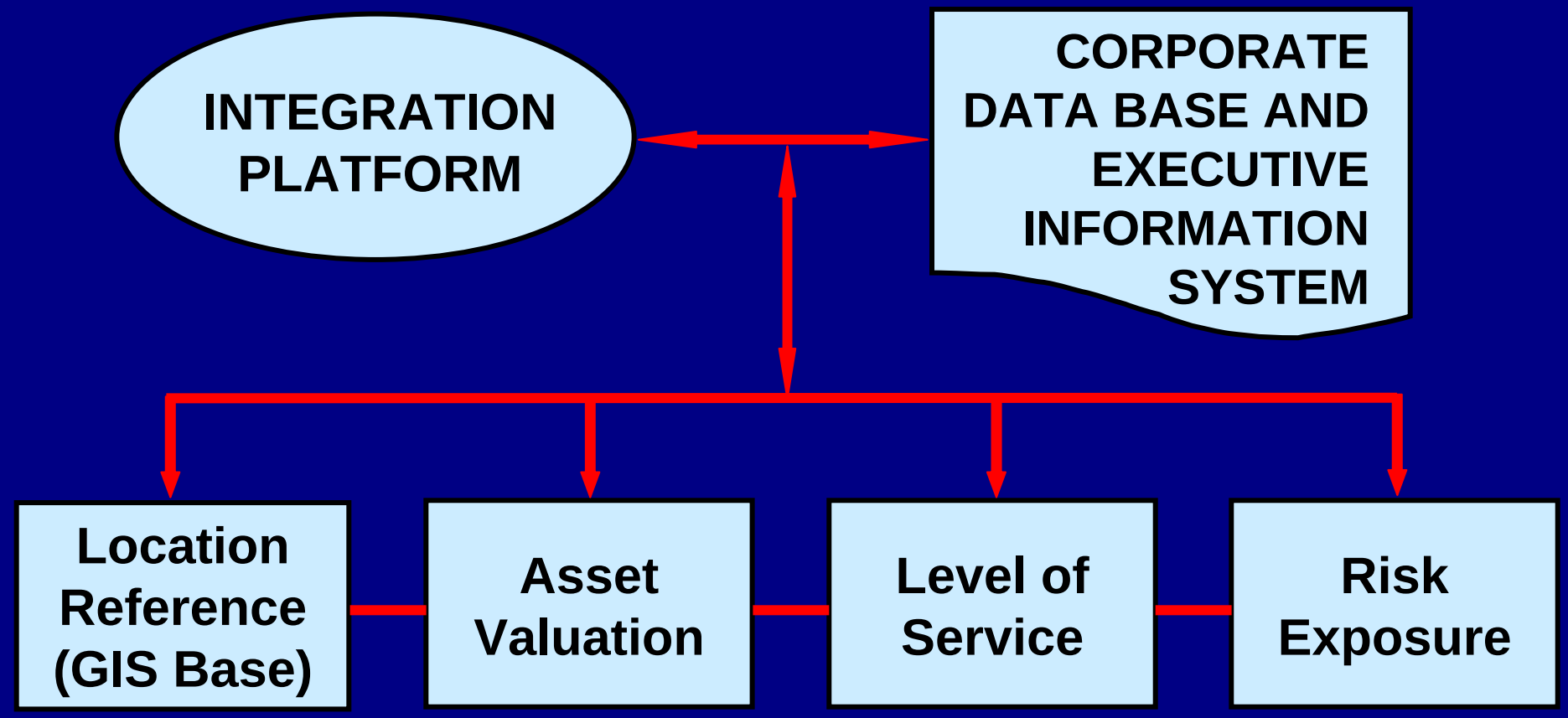
- Financial Accounting: (Book value, based on depreciated as-built cost)



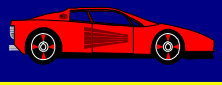
- Management Accounting: (Current value, based on written down replacement cost)

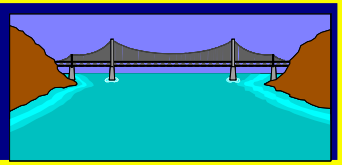


KEY ELEMENTS OF AN INTEGRATION PLATFORM

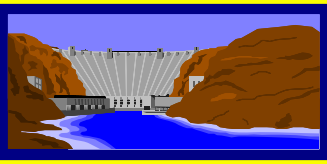


1. TRANSPORTATION

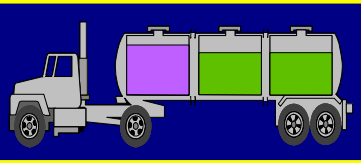


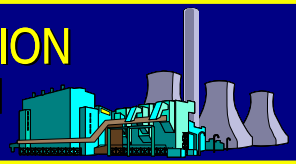
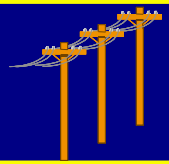
2. WATER AND WASTEWATER

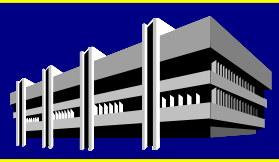
3. WASTE MANAGEMENT



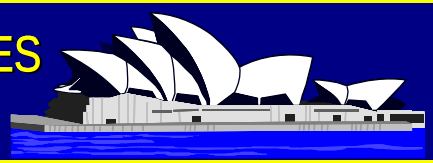

4. ENERGY PRODUCTION AND DISTRIBUTION

5. BUILDINGS

6. RECREATION FACILITIES



7. COMMUNICATION


Privatization / “P3”

- Numerous examples and variations
- Some success stories
- Some disasters
- Not simple; proper structuring, financing, performance requirements, etc. are essential !

IDEAL PMS OF THE FUTURE

Seamless implementation at all levels

Effectively integrated with AMS

Extensive data base (long term, reliable, used)

Effective communication with all stakeholders

Buy-in at all levels to policy objectives and implementation targets

Explicit incorporation into agency business plan

Leadership with commitment to excellence

Provision of resource needs

"Culture" of innovation and advancements

A FUTURE FOR PAVEMENT MANAGEMENT ?

Was There ?

Is There ?

Susan Tighe
PhD, P.Eng.

Dr. Susan Tighe, P.Eng, Canada Research Chair and Associate Professor of Civil Engineering, University of Waterloo *Dr. Susan Tighe is currently a Canada Research Chair in Pavement and Infrastructure Management and an Associate Professor of Civil Engineering at the University of Waterloo. She recently received the Young Engineer Award from the Professional Engineers of Ontario. She is an author of over 80 technical publications in pavements and infrastructure and is involved in a number of research projects. She is a member of various Transportation Research Board activities including the LTPP Expert Task Group on Data Analysis, and the Chair of the Subcommittee on Airport Pavement Management Systems.*
She is the Chair of the Transportation Association of Canada's, (TAC) Standing Committee on Soils and Materials, and a member of their Standing Committee on Pavements. Susan worked four years for the Ministry of Transportation of Ontario and most recently spent five months in Australia working for a contractor as a senior technical advisor.

University of Waterloo

Ralph Haas
PhD, P.Eng.

Dr. Haas is the Norman W. McLeod Engineering Professor and Distinguished Professor Emeritus at the University of Waterloo. He has lectured and consulted worldwide and authored 10 books and 400 technical papers in the areas of infrastructure, pavements and transportation. Dr. Haas is Founding Director of the University's Centre for Pavement and Transportation Technology (CPATT). His contributions have been recognized by various honours and awards including the Order of Canada, Fellow of the Royal Society of Canada, Fellow of the Canadian Academy of Engineering and recipient of the Canadian Society for Civil Engineering's Sandford Fleming Award for "outstanding contributions to research and education in the field of transportation engineering".