

Municipal Engineering Foundation Victoria

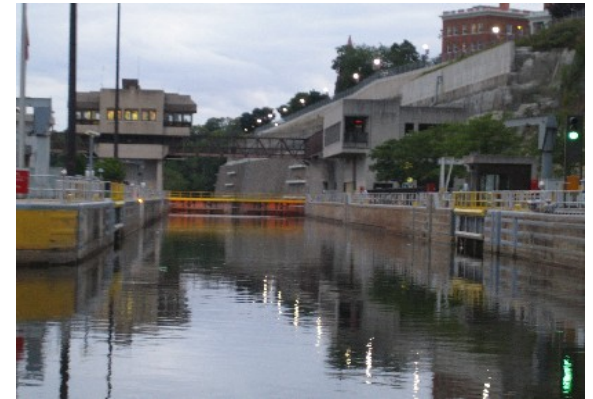
2005 STUDY TOUR REPORT

## Best Practice Management of Aging Infrastructure Assets



Hong Kong  
UK

Canada  
USA



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*Note:* The views expressed in this report are those of the author and do not necessarily represent the views of the City of Boroondara.

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## Synopsis

Aging infrastructure is an issue that faces many predominantly “built” municipalities. There are many instances where adequate funding has not been placed into maintenance of infrastructure assets and municipalities are facing problems in financing the renewal of their aging infrastructure.

The Municipal Engineering Foundation of Victoria offered a Study Award to each of two professional Victorian Local Government Engineers to undertake an approved course of study as part of a study tour to the USA, Canada, Hong Kong and the UK. Attendance at the American Public Works Association congress in Minneapolis was also undertaken as part of the Study Tour. My topic of study was best practice management of aging infrastructure assets.

Three particular questions were derived from the study topic that considers the inter-connectivity of levels of service, community needs/expectations, affordability, availability of funds, competing priorities and competing standards and policies as they relate to infrastructure assets. The study sought answers to the questions of:-

- How are existing infrastructure assets managed and maintained in the municipality?
- What strategies are used to reduce consumption?
- How is planning for and providing new infrastructure for future needs undertaken?



Observations of initiatives identified at each of the six study visits to local authorities in the four countries visited enabled collection of data pertaining to best practice management of aging infrastructure assets. Many of the identified initiatives could be applied to Victorian municipalities.

Outcomes of the study are presented within this Study Report as lists of practical applications that Victorian councils can consider for implementation to assist in management of aging infrastructure.

## 1. Introduction

The Municipal Engineering Foundation Victoria encourages Local Government Engineers to undertake study and research and to gain experience in the science and management of engineering practice within the Commonwealth of Australia and countries overseas. A Study Award was offered to each of two professional Victorian Local Government engineers to travel, together with other members from an IPWEA (Institute of Public Works Engineers Australia) National Study Tour Group, to the USA, Canada, Hong Kong and the UK including attendance at the APWA (American Public Works Association) Congress in Minneapolis, Minnesota during September 2005. This provided the opportunity for participants to enhance their professional skills and development by attending conferences and participating in study visits to local authorities in other countries.

The study tour included participants from Western Australia, New South Wales, Tasmania, Queensland and Victoria.

The broad aim of the study tour was to examine best practice and innovation in public works with the tour focus concentrating predominately on the issues of asset management and sustainable transport. Within the broad aim of the study tour each participant had a specific topic of study.

This report seeks to document observations made during visits to municipalities in Hong Kong, Canada, USA and UK as part of the study tour relating to best practice management of aging infrastructure assets that could be considered for implementation by Victorian municipalities. Each municipality visited was considered in the context of a study visit and described in terms of:-

- the municipalities context,
- description of their infrastructure problems,
- how their existing infrastructure assets were managed and maintained effectively,
- strategies used to reduce consumption,
- how planning for and providing new infrastructure for future needs was undertaken.

Outcomes from an analysis of the observations were then documented and recommendations made for alternative ways Victorian municipalities could address the management of aging infrastructure assets.





## 2. Study Topic

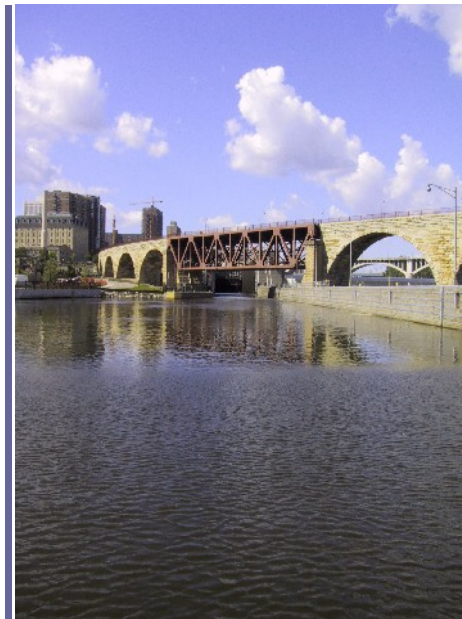
Boroondara is an inner city council in Melbourne, a predominately “built” city and has issues associated with performance management of its aging infrastructure asset base. Many of the assets are near the end of their serviceable life but funding to renew assets in their present form is unavailable. Innovative ways of addressing these issues are required to enable sustainability of needed infrastructure.

The IEAust Special Issue “Infrastructure Australia” publication dated May 2005 describes asset management is a “trade-off” between:-

- levels of service
- community needs/expectations
- affordability
- availability of funds
- competing priorities
- competing standards and policies

This means we need to manage and maintain existing infrastructure more efficiently, reduce consumption and plan for and provide new infrastructure for future needs.

I was keen to find out what happened overseas in respect of best practice management of aging infrastructure assets and find some initiatives that could be applied to Victorian councils and Boroondara City Council in particular.



Three particular study questions relating to the study topic of “Best Practice Management of Aging Infrastructure Assets” were formulated to guide my questioning during the Study Tour.

*Study Question 1:* How are existing infrastructure assets managed and maintained effectively?

*Considerations:* Aspects of this question include consideration of strategic management systems for assets and asset management tools used by local authorities.

*Study Question 2:* What strategies are used to reduce consumption?

*Considerations:* This includes consideration of sustainable transport systems, sustainable drainage initiatives and sustainability in councils building stock. The aspect of behavioural change programs required to meet performance objectives for council’s transport, drainage and building assets is of particular interest.

*Study Question 3:* How is planning for and providing infrastructure for future needs undertaken?

*Considerations:* Capital planning methods, approach to risk and corporate governance systems used by councils to further their asset management would be considered in answer to this study question.

### 3. Methodology

This section of the report describes the methodology adopted in this study topic. Development of the study visit protocol and format of the study visits are discussed, an overview of the observational analysis used is cited and the limitations of using such a methodology detailed.

The study tour could be considered to fit within the descriptive case study approach to research. Good research techniques dictate the need for development of a case study protocol according to Yin (1994) in his book “Case Study Research”.

#### 3.1 Study Visits Protocol

For this study tour a protocol was established to guide the investigator in undertaking the study visits. It is made up of four sections, these being:-

1. *Overview of each study visit* project including project objectives, research issues, relevant literature concerning the investigating topic

2. *Field procedures* which involved the following methods of data collection:-

- Data collection from field visits to each council through observation
- Data collection from presentations given at each council visited
- Data collection from questions to relevant infrastructure staff at each of the councils visited
- Data collection from general observations at each municipality visited
- Data collection from email correspondence with relevant council expert upon return to Australia



3. *Study visit questions.* A set of study visit questions was developed prior to commencement of the study tour. The questions addressed the research issues identified and were grouped around aspects of:-
  - Context of the council
  - Infrastructure problems encountered by the council
  - Efficient management and maintenance of existing infrastructure
  - Reducing consumption and in particular considering solutions and best practice in sustainable transport, sustainable stormwater, sustainable road and sustainable property solutions.
  - Capital planning for infrastructure

4. *Study visit report.* A report of each study visit was written using a proforma with the following five headings:-

- Context
- Infrastructure problems
- Efficient management and maintenance of existing infrastructure
- Reducing consumption
- Capital Planning



Each of these study visit reports is reproduced in **Appendix A to F** to this report. The report format was adopted to enable some comparison to be made of the data collected and assist in looking for similarities in the data.

The names of presenters and those questioned for the information required to undertake each study visit have not been identified for ethical reasons, to protect them from any harm and having an effect on future business dealings. Anonymity is not considered a desirable outcome as it eliminates some important background information about the case and makes the mechanics of composing the case difficult.

Six councils were visited in four countries forming the case studies for this research report. The annual American Public Works Conference in Minneapolis was also visited by the Study Tour Team. The councils visited are tabulated in Table 3.1.

**Table 3.1.** List of Study Visits

<i>Study Visit</i>	<i>Country</i>	<i>City Visited</i>	<i>Region</i>	<i>Date of Visit</i>	<i>Information Source</i>
No.1	Hong Kong	Cyberport	Hong Kong Island	3/09/05	<ul style="list-style-type: none"> <li>• Presentation by Director</li> <li>• Accompanied site visit</li> <li>• General observations</li> </ul>
No.2	Canada	Edmonton	Alberta	7/09/05	<ul style="list-style-type: none"> <li>• Presentation by panel of infrastructure experts</li> <li>• Guided tour of council offices and prominent infrastructure projects</li> <li>• General observations</li> <li>• Email contact with expert</li> </ul>
No.3	Canada	Calgary	Alberta	9/09/05	<ul style="list-style-type: none"> <li>• Presentation by panel of infrastructure experts</li> <li>• General observations</li> </ul>
No.4	North America	Minneapolis	Minnesota	15/09/05	<ul style="list-style-type: none"> <li>• Questions to infrastructure expert panel and CEO</li> <li>• Guided tour of prominent infrastructure of city by infrastructure staff</li> </ul>
No.5	North America	Eden Prairie	Minnesota	15/09/05	<ul style="list-style-type: none"> <li>• Presentation by CEO</li> <li>• Informal question time available to Infrastructure Director</li> <li>• Visit to Municipal Offices</li> </ul>
No.6	England	Brighton and Hove	Southern England	19/09/05	<ul style="list-style-type: none"> <li>• Presentation by CEO</li> <li>• Guided tour of prominent infrastructure projects by Director and engineering staff</li> <li>• Email contact with expert</li> </ul>

Each council visited generously provided staff expert in infrastructure issues to give an overview of the municipalities context, to explain the specific problems encountered by the particular council and systems and processes involved in addressing these problems. A limited question time was then available for the Study Team to ask any questions before a site visit to various infrastructure sites within the municipality was undertaken. From the presentations and limited question time it was possible to collect enough data to organise it within the prepared proforma to address the study topic.

All six study visits are attached as **Appendix A to F** to this report.



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### 3.2 Study Visit Observations and Data Analysis

Data analysis consisting of examining, categorizing and tabulating text from each of the study visits was undertaken to address the initial propositions of the study. The descriptive framework revolved around five sections of context, infrastructure problems, efficient management and maintenance of existing infrastructure, reducing consumption, and capital planning for each local authority visited. The use of computers to assist

in analysis was not considered necessary in this research except in end presentations and matrix presentations of text data. The analysis focused on exploring the study question developed and development of conclusions about the study question. The study made possible the development of practical management strategies



for management of infrastructure problems. Analysis and comparisons between each of the study visits is discussed in **Section 4** of this report.

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### 3.3 Shortcomings of Study Visit Approach

- As the available method of information collection was different at each council visited it was not possible to compare results in a reliable way.
- The form of questioning was not consistent at each council visit resulting in unavailability of all information required to produce a reliable set of data for comparison, analysis and conclusion.
- All participants in the Study Tour had various topics to research under the broad heading of “Best Practice and Innovation in Public Works”. It was thus impossible for all topics to be covered in depth at each council given the limited time allocated for the council presentation and question time. To address this problem email contact was made on return to experts at various local authorities who provided more details relating to the study topic.
- An extended text form of analysis has limitations making comparisons difficult. Text is a weak and cumbersome form of display. As well, it is dispersed over many pages, it may be sequential, poorly ordered and bulky.

## 4. Observations/Comparison

This section of the report identifies observations made during the six study visits in relation to the study topic and attempts to analyse the data and discuss potential strategies that arise relevant to application in Victorian councils. Reference is made to the six study visits detailed in Appendix A to F to this report for local authorities in Hong Kong, Canada, USA and UK.



### 4.1 Infrastructure Problems

A common factor in all cities visited is that there is an “infrastructure gap”, the “infrastructure gap” is growing and it requires innovative ways for it to be addressed. If we continue in our present methods of operation of our assets the “infrastructure gap” will not be able to be funded. Consequences will be seen in further deterioration and collapse of our infrastructure supporting the lifestyles we currently enjoy.

### 4.2 Study Question 1 - Efficient Management and Maintenance of Existing Infrastructure

*Study Question 1:* How are existing infrastructure assets managed and maintained effectively?

A range of management initiatives for maintenance of infrastructure assets were observed at each of the local authorities visited. Some of these ideas could be applied to Victorian municipalities. The effectiveness of the identified initiatives for efficient management and maintenance of existing infrastructure are considered in terms of how they meet levels of service, community needs/expectations, the affordability and ability to fund, competing priorities and competing standards and policies.

**Table 4.1** summarises some infrastructure management ideas identified from Study Visits as possible systems that could be applied to municipalities in Victoria. A discussion of each identified initiative then follows.

**Table 4.1** – Summary of some infrastructure management initiatives identified from Study Visits.

<i>Observed Infrastructure Management Initiative</i>	<i>Application of Management Initiative</i>	<i>Source</i>
Co-ordinate infrastructure works with all service users in road reserves	Meets community expectations of minimal disruption to road access due to road works. Better use of natural resources and labour resources in digging of the roadway once with no rework required to accommodate yet another service repair.	City of Edmonton and Calgary, Canada. Cyberport, Hong Kong
Replacement of infrastructure at theoretical “end of life”	Advantages realised in achieving a fully planned maintenance program rather than a predominately reactive maintenance program. Advantages in allocating future funding for asset renewals.	Cyberport, Hong Kong
Utilisation of facilities in conjunction with physical condition	Funding advantages as reduction in number of buildings results in reduced maintenance costs. Excess buildings can be sold to fund other infrastructure or building projects. Encourages community building where more than one service co-located.	City of Edmonton and Calgary, Canada
Advocacy to central government to fund a higher proportion of petrol tax towards transport initiatives	A means of funding transport infrastructure.	City of Edmonton and Calgary in oil rich province of Alberta, Canada
Development of performance indicators for infrastructure services	Nationally set PI's in the UK are required to be met in order to acquire funding for each particular infrastructure sector	Brighton and Hove Council, UK
Maximising use of web and media for communication of infrastructure initiatives	Education of infrastructure initiatives to residents through communication strategies changes service standards with potential to reduce consumption.	City of Eden Prairie, North America
Use of convict labour for infrastructure maintenance projects	A means of funding infrastructure maintenance projects	City of Eden Prairie, North America

Co-ordination between all service authorities (water, electricity, gas, telecommunications, roads) that use the road reserve for transportation of their assets could result in better management of the road reserve. It would enable a “whole of street replacement” for assets giving the immediate advantage of reduced disruption due to street works to adjacent residents, reduction in rework required when one service is maintained and then disturbed shortly after works are completed to enable another service to be maintained. This approach is evident in the Canadian councils of Calgary and Edmonton where the city has been divided into areas where workable parcels of work can be achieved on a yearly basis on a cyclic basis. In these councils a “whole of street replacement” strategy for the city has been developed and appropriate funding for such allocated in the long term finances of the city.



Cyberport in Hong Kong can be considered a municipality in its own right as it controls all infrastructure for the development. Cyberport replaces all infrastructure at the end of its theoretical life.

The IT systems are continuously upgraded. The roads and drains are replaced every 50 years regardless of condition. This has the advantage in proactive cyclic planning for the asset replacement rather than reactive maintenance. The required financing for such events can be budgeted well in advance with replacement costs taken into consideration in any infrastructure proposals for the development.

Calgary City Council considers the utilisation of facilities in conjunction with their physical condition. Where there are opportunities to co-locate community services in one building and reduce the number of buildings within the portfolio maintenance costs can be reduced whilst still providing the same service. Redundant, underutilised properties are then available for sale, which in turn can finance the housing of the co-located services.

The Canadian Councils of Calgary and Edmonton, in the oil rich province of Alberta, lobby central government for a higher portion of petrol tax to be dedicated to fund transport infrastructure and sustainable transport initiatives.

North American municipalities, Minneapolis and Eden Prairie, have set indicators for service provision. The UK councils, including Brighton and Hove, have nationally set indicators for service. Progress towards meeting the set indicators determines the degree of funding available to the city.



Maximising use of all media for communication strategies in asset management greatly assists in service provision. The CEO of the City of Eden Prairie in North America uses a web BLOG on a daily basis to communicate current infrastructure issues of note. All council meetings are televised live on the local TV station as are features of current infrastructure projects.

Use of convict labour for maintenance works is widespread in the City of Eden Prairie and reduces maintenance labour costs.

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### 4.3 Study Question 2 - Reducing Consumption

| *Study Question 2: What strategies are used to reduce consumption?*

Reducing consumption can lead to a more sustainable portfolio of infrastructure for a city. For example, when travel trips are reduced traffic congestion becomes less, air pollution is reduced, less fuel is used and less use is made of the road pavement.

Theoretically the road pavement should then last longer and capacity of the roadway would either be retained or reduce. This would give an element of sustainability to the transport system. An example of sustainable stormwater management may be incorporation of a



stormwater retention basin into an existing drainage system to retard flows before releasing into the waterway thereby eliminating the need for a larger pipe upgrade downstream to the waterway. The retention basin could also incorporate re-use of stormwater which has additional benefits in saving valuable potable water supply.

Table 4.2 summarises some initiatives identified from the study visits that reduce consumption.



**Table 4.2** – Summary of observed initiative in reducing consumption

<i>Observed initiative</i>	<i>Application of initiative</i>	<i>Source</i>
<b>Sustainable Transport Strategies</b>		
Travel demand strategies such as travelsmart requiring behavioural change strategies	<p>Gives choice in travel modes and reduces number of vehicles on road.</p> <p>A modal shift has been achieved in Brighton from private vehicles to buses.</p> <p>A status quo has been achieved in traffic congestion to the city of Calgary, North America</p>	<p>Brighton and Hove Council, UK</p> <p>City of Calgary, North America</p>
Car pooling	Council is used to set the example of sustainable transport within the community.	City of Edmonton,
Car sharing	<p>Signage along state highways advising of telephone number to call to share a ride, such as seen in the journey from the predominately residential area of Eden Prairie to the “down town” of the twin City of Minneapolis and St Paul.</p> <p>Advertising brochures for car share companies widely available within the council.</p> <p>Brighton and Hove council require developers to implement a car share scheme as a requirement on large developments as a means to control parking and traffic congestion.</p>	<p>City of Eden Prairie, North America</p> <p>Greenwich, London</p> <p>Brighton and Hove Council, UK</p>
Bike path strategy for city	<p>Gives opportunity for all to cycle to activity centres. Variety of ways to provide cycle lanes include:-</p> <ul style="list-style-type: none"> <li>• Wide shared use footpaths</li> <li>• Bus/taxi/bicycle lanes</li> <li>• Contra-flow bike lanes on one way streets</li> <li>• Wide kerb side lanes</li> </ul>	City of Edmonton, Canada
Maintenance program for footpaths that are in poor condition.	Ensures pedestrian access to encouraging alternative modes of transport to the private motor vehicle. Also assists in development of a proactive maintenance program for	City of Edmonton, Canada

<i>Observed initiative</i>	<i>Application of initiative</i>	<i>Source</i>
	footpaths	
Real time bus information	Encourages bus patronage	Brighton and Hove Council, UK
Bike racks on front of buses	Assisting in increasing bike riders and use of public transport. Gives choice of travel to people which in turn will reduce	City of Minneapolis and St Pauls. City of Edmonton
Traffic lights with count down facility for pedestrians crossing the road showing how many seconds left to cross the road.	Assisting pedestrians	Edmonton and Calgary in Canada
Developer requirements for walking and cycling	Objective is to provide choice of travel mode and encourage other forms of transport than the private vehicle	
<b>Sustainable Stormwater Management</b>		
Wetlands	Provides habitats for birds and aquatic wildlife whilst providing a stormwater quality system for rainfall and can also be considered as retention system for stormwater Community asset for recreational purposes	City of Edmonton, Canada
Water Gardens – using the natural contours to drain stormwater to a low point where a soak-away type area is located. The soak-away area contains appropriate plants which use the water and act as a filter to improve stormwater quality.	Can eliminate the need for hard core drainage infrastructure such as pipes and pumps. Provides decoration for the city with appropriate plantings and cleans the stormwater before it enters the closest waterway. Traffic islands, medians and vegetated road verges can accept stormwater for treatment.	City of Minneapolis, Northern America
Water sensitive urban design principles	A wide variety of applications are apparent within the northern American cities for water sensitive urban design.	City of Minneapolis and City of Eden Prairie, Northern America
Stormwater re-use	Collection of stormwater from roof of buildings for use in cooling towers	Cyberport, Hong Kong

#### 4.4 Study Question 3 – Planning for Infrastructure

*Study Question 3: How is planning for and providing infrastructure for future needs undertaken?*

The systems used for capital planning and ways of funding infrastructure have a bearing on best practice management of aging infrastructure.

A risk based decision making process for capital planning to assist in funding the greatest needs is used in the Canadian cities of Edmonton and Calgary. Both cities have long term financial strategies and a central focus on asset management.

The Cyberport project in Hong Kong has been planned in stages so that the sales from the first stage finance subsequent stages. Victorian councils could consider staging large projects, particularly building projects and look for sale of a property or lease of a building as a milestone before embarking on the second stage of the project.

The City of Eden Prairie in North America has a capital improvement plan which is published on its web site.

It is difficult to compare capital planning between councils in USA, UK, Hong Kong and Australia as service provision by local government is different in each country and it is difficult to extract the infrastructure component of the budget for comparison purposes.

The Cities of Edmonton and Calgary in Canada obtain funding from a portion of the fuel tax revenue from the Provincial Government to assist in transportation infrastructure initiatives. Brighton and Hove Council in the UK are required to submit performance measures to obtain funding from central government for infrastructure works.

Governing of assets can draw on any of three models of governance, these being “market”, “bureaucratic”, and “community”. Conventional approaches to governance of infrastructure assets have largely traditionally operated under a bureaucratic model of governance and more recently adopted elements of market and community models of governance. An emerging approach of shared responsibility, participation and networked stakeholders is likely to play an increasingly important role in the pursuit of more sustainable asset governance.

The Northern American local authority of Minneapolis has a bureaucratic model of governance which affects the governance of the infrastructure assets of the organisation particularly in relation to authorisation for decision making. The bureaucracy makes it quite difficult for assigning responsibility and accountability for decisions resulting in long lead times for delivery of capital projects.

## 5. Recommendations

It is recommended that the following initiatives could be considered for implementation by Victorian Municipalities. An implementation plan detailing the recommended initiative, how it could be implemented and by whom is set out in Table 5.1.

**Table 5.1** – Implementation action plan for recommendations.

<i>Recommended Initiative</i>	<i>Implementation Actions</i>	<i>Implementing Authority</i>
Efficient Management and Maintenance of Existing Infrastructure		
Whole of street replacement strategy	<p>There are several ways this can be implemented. Consider the following:-</p> <p>a) Set up a committee comprising local government representatives and representatives from service authorities (water, sewer, drainage, gas, electricity, communications) to develop a common management system between all service authorities that can be used by all municipalities. This could be set out in a code of practice and if adopted could be regulated.</p> <p>b) Each municipality can approach each service authority operating within its boundaries and discuss their planned road/street asset 5 year planned forward maintenance program. A revised program may then be adopted based on the service authority's forward proactive 5 year maintenance program.</p>	<p>a) A group of professionals who practice in the area of infrastructure maintenance and are aligned to a professional association such as IEAust, LGProAsset Group, IPWEA may be interested in taking the lead in establishing the committee. The MAV could also take the lead if this initiative falls within its mandate.</p> <p>b) Councils take the lead in conjunction with service authorities operating within the particular municipality.</p>
Property portfolio management based on service utilisation in conjunction with asset condition	<ol style="list-style-type: none"> <li>1. Each municipality to undertake an analysis of their properties considering utilisation of each property in conjunction with services delivered.</li> <li>2. Where under utilisation occurs consider optimisation of property usage by integration of council services where possible and sale of redundant properties to finance integrated facility.</li> </ol>	Lead to be taken by each municipality facility management section.
Lobby State and Federal Government for a higher percentage of fuel tax to be diverted to transport infrastructure and sustainable transport	<p>The process of implementation adopted would be specific to each council that viewed this issue with concern. Suggested implementation options are as follows:-</p> <ol style="list-style-type: none"> <li>1. Council officers could seek direction from their councillors as to appropriateness of council writing a letter to state and federal government seeking a higher proportion of fuel tax directed to</li> </ol>	<ul style="list-style-type: none"> <li>• Each municipality</li> <li>• Metropolitan Transport Forum (MTF)</li> <li>• Municipal Association of Victoria (MAV)</li> <li>• Professional Associations with an interest in transport infrastructure such as IEAust, IPWEA, LGPro Asset Group.</li> </ul>

<i>Recommended Initiative</i>	<i>Implementation Actions</i>	<i>Implementing Authority</i>
initiatives.	<p>transport infrastructure and sustainable transport initiatives.</p> <ol style="list-style-type: none"> <li>2. MAV could be approached to:- <ul style="list-style-type: none"> <li>• support the initiative and to develop a proforma type letter which municipalities could use to lobby central government</li> <li>• be a focal point for information dissemination to all councils concerning this issue.</li> </ul> </li> <li>3. MTF could be approached to support the initiative and write letters to central government concerning this issue</li> <li>4. A group of Local Government officers affiliated with a professional organisation that has an interest in transport infrastructure (such as IEAust, IPWEA, LGProAsset Group) could be appointed to drive the initiative.</li> </ol>	
<b>Reducing Consumption</b>		
Travel demand strategies such as Travelsmart requiring behavioural change strategies	<p>Adopt Travelsmart initiatives on a council wide basis:-</p> <ul style="list-style-type: none"> <li>• within council</li> <li>• within schools</li> <li>• within businesses</li> <li>• consider placing Travelsmart requirements as a condition of planning approval on development applications</li> </ul> <p>Travel demand study similar to Melbourne’s Northern Corridor Transport Study to be undertaken to create a baseline of travel patterns for eastern/south-eastern area of Melbourne. Councils within this region can then work together on longer term planning to reduce travel trips by private motor vehicle.</p>	<p>Each municipality, in conjunction with DoI, to adopt Travelsmart initiatives.</p> <p>Travel demand study for east/south-eastern group of councils to be undertaken using grant monies. Specialist group to be set up with members from participating councils with joint responsibility for study and chaired by DoI.</p>
Car pooling	<ul style="list-style-type: none"> <li>• Consider converting the municipality pool of cars into a car club to make vehicles available to staff for out-of-hours use.(Provide a “taxi home” service if car sharing fails)</li> <li>• Cars could be run by an independent car club operator with local businesses joining together to make the scheme more viable</li> <li>• Workplace car clubs reduce commuting by car, cut workplace parking pressure and can help ease rush hour traffic.</li> <li>• Suggested models to follow for implementation can be found at website</li> </ul>	<p>Each municipality to consider appropriateness of initiative with transport management section taking the lead.</p>



<i>Recommended Initiative</i>	<i>Implementation Actions</i>	<i>Implementing Authority</i>
	<a href="http://www.carclubs.org.uk">www.carclubs.org.uk</a> .	
Car sharing	<p>Sharing Car Ownership Set up a car club with a car already owned or by purchasing together. Club to have a booking system, payment system, priority use system, recording car usage system, exiting from system arrangements and taxation issues. Consider using Smart Moves set up system found at website <a href="http://www.smartmoves.co.uk">www.smartmoves.co.uk</a></p> <p>Lift Share Set up a data base where residents can automatically be matched with someone to share a journey and costs. Suggested models to follow include those at website <a href="http://www.liftshare.com">www.liftshare.com</a>, <a href="http://www.nationalcarshare.co.uk">www.nationalcarshare.co.uk</a>, <a href="http://www.shareajourney.com">www.shareajourney.com</a> or <a href="http://www.autonettcarshare.com">www.autonettcarshare.com</a></p>	<p>Each municipality to consider appropriateness of initiative with community services section to take lead.</p> <ul style="list-style-type: none"> <li>• Consider using external service providers already established in car sharing ownership system such as <a href="http://www.flowcars.com.au">www.flowcars.com.au</a> in the inner Melbourne area.</li> <li>• Lift Share database and on-line matching to be administered by each municipality with community services department taking the lead. Alternatively the municipality could join with or link with an external provider for this service.</li> </ul>
Council fleet management	<p>Municipality specific. Consider introduction of initiatives such as:-</p> <ul style="list-style-type: none"> <li>• Incentives for company cars which are more fuel efficient.</li> <li>• Lobby central government to apply a range of taxing options for cars with less tax being paid for more fuel efficient cars.</li> <li>• Addition of electric bikes, mopeds, scooters into councils transport fleet.</li> <li>• Introduction of Green Travel Plan</li> <li>• Reconsider councils travel policy and develop a workplace travel plan if one does not exist</li> <li>• Look at details of lump sum and/or mileage allowances for car/bicycle/walking</li> <li>• Transport information availability for employees</li> <li>• A lift sharing database, preferential parking and taxi backup</li> <li>• Home working, flexi-time and compressed working (when you can take a day off provided hours are working in advance)</li> <li>• Shifts to fit with public transport</li> <li>• Cash instead of parking or a company car</li> <li>• Interest-free travel loans for a bicycle or travel pass</li> <li>• Discounts/subsidies on public transport</li> <li>• Lockers and showers</li> <li>• Walking initiatives such as zebra crossings and low kerbs</li> </ul>	<p>Each municipality to consider appropriateness of initiatives with fleet management department taking the lead</p>

<i>Recommended Initiative</i>	<i>Implementation Actions</i>	<i>Implementing Authority</i>
	<ul style="list-style-type: none"> <li>• Provision of secure, convenient bike rack parking, bike fleet and bike maintenance subsidies</li> <li>• On site facilities eg kitchen/canteen/nursery/cash machine</li> </ul>	
Bike path strategy for municipality	<ul style="list-style-type: none"> <li>• Undertake local area bike strategy for each municipality with aim of establishing bicycle links to activity centres, schools and major municipal facilities.</li> <li>• Link bike paths with neighbouring municipalities</li> <li>• Link bike paths with Principle Bike Network on major roads</li> <li>• Consider use of cycle lanes such as:- <ul style="list-style-type: none"> <li>○ Off road cycle lanes</li> <li>○ Wide shared use footpaths</li> <li>○ Bus/taxi/bicycle lanes</li> <li>○ Contra-flow bike lanes on one way streets</li> <li>○ Wide kerb side lanes</li> </ul> </li> <li>• Marketing of bike strategy throughout community with adequate signage along route and with appropriate maps</li> </ul>	<ul style="list-style-type: none"> <li>• VicRoads for Principal Bike Network on main roads</li> <li>• Municipality for local bike network on local roads</li> </ul>
Maintenance program for footpaths in poor condition	<ul style="list-style-type: none"> <li>• Establish appropriate service standard for footpaths within municipality together with appropriate inspection regime. This may be different for different usage eg. higher standards may be required along shopping strips and outside schools than down back laneways.</li> <li>• Undertake maintenance inspection of all paths within municipality</li> <li>• Rate each section of path using a condition based approach.</li> <li>• Establish an optimal maintenance program to fix paths that do not meet the required service standard.</li> <li>• Maintain a proactive approach to footpath maintenance by development of a cyclic maintenance program to fit within given budget constraints.</li> </ul>	Each municipality to undertake maintenance program with lead taken by works section.
Lobby bus companies and central government to place bicycle racks on front of buses	<p>The process of implementation adopted would be specific to each council that wished to progress this issue. Suggested implementation options are as follows:-</p> <ul style="list-style-type: none"> <li>• Council officers could seek direction from their councillors as to appropriateness of council writing a letter to bus companies and central government seeking bike racks on front of buses.</li> <li>• MAV could be approached to:-</li> </ul>	<ul style="list-style-type: none"> <li>• Each municipality</li> <li>• Metropolitan Transport Forum (MTF)</li> <li>• Municipal Association of Victoria (MAV)</li> <li>• Professional Associations with an interest in transport infrastructure such as IEAust, IPWEA, LGPro Asset Group.</li> </ul>

<i>Recommended Initiative</i>	<i>Implementation Actions</i>	<i>Implementing Authority</i>
	<ul style="list-style-type: none"> <li>• support the initiative and to develop a proforma type letter which municipalities could use to lobby central government</li> <li>• be a focal point for information dissemination to all councils concerning this issue.</li> </ul> <p>3. MTF could be approached to support the initiative and write letters to central government and bus companies concerning this issue</p> <p>4. A group of Local Government officers affiliated with a professional organisation that has an interest in transport infrastructure (such as IEAust, IPWEA, LGProAsset Group) could be appointed to drive the initiative.</p>	
<p>Lobby central government to continue and expand implementation of real time bus information to all bus routes.</p>	<p>The process of implementation adopted would be specific to each council that viewed this issue with concern. Suggested implementation options are as follows:-</p> <ul style="list-style-type: none"> <li>a) Council officers could seek direction from their councillors as to appropriateness of council writing a letter to central government seeking to expand implementation of real time bus information to all bus routes.</li> <li>b) MAV could be approached to:-</li> <li>c) support the initiative and to develop a proforma type letter which municipalities could use to lobby central government</li> <li>d) be a focal point for information dissemination to all councils concerning this issue.</li> <li>e) MTF could be approached to support the initiative and write letters to central government concerning this issue</li> <li>f) A group of Local Government officers affiliated with a professional organisation that has an interest in transport infrastructure (such as IEAust, IPWEA, LGProAsset Group) could be appointed to drive the initiative.</li> </ul>	<ul style="list-style-type: none"> <li>• Each municipality</li> <li>• Metropolitan Transport Forum (MTF)</li> <li>• Municipal Association of Victoria (MAV)</li> <li>• Professional Associations with an interest in transport infrastructure such as IEAust, IPWEA, LGPro Asset Group.</li> </ul>
<p>Traffic lights with council down facility for pedestrians crossing the road showing how many seconds left to cross the road.</p>	<p>Each municipality that considers the initiative of benefit to seek advice consent from VicRoads for implementation at appropriate locations where pedestrian assistance in crossing roads is critical.</p>	<p>VicRoads</p>

<i>Recommended Initiative</i>	<i>Implementation Actions</i>	<i>Implementing Authority</i>
Developer requirements for walking and cycling	<ul style="list-style-type: none"> <li>Place requirement to provide choice of travel mode and encourage other forms of transport than the private motor vehicle in municipal planning scheme as a developer requirement.</li> <li>Walking paths and cycle paths within new developments to link to the municipal walking and cycling paths and conform to municipal walking and cycling strategies.</li> <li>Encourage share car ownership schemes within new subdivisional residential developments</li> </ul>	Each municipality planning department to take lead in implementation of initiative as appropriate for municipality.
Look for opportunities to use water gardens within municipality	<ol style="list-style-type: none"> <li>Identify possible locations to site water gardens from stormwater management plans and stormwater quality and flood studies of municipality</li> <li>Consider fit with Melbourne Water waterways and approvals required</li> <li>Consider availability of funding grants from central government for proposed water garden scheme to reduce cost to municipality.</li> </ol>	Each municipality engineering design department to take the lead
Stormwater re-use as standard requirement	<ol style="list-style-type: none"> <li>Place requirement in municipal planning scheme as developer requirement.</li> <li>Each municipal building to incorporate re-use of stormwater where feasible when facility nears end of useful life and requires maintenance, upgrade or new build and works are planned.</li> <li>Consider each parkland and sporting facility area (playing fields, golf courses, swimming pools) for potential stormwater collection and re-use.</li> <li>Set up a system for measurement of stormwater re-use with municipality.</li> </ol>	Each municipality engineering design department to take the lead
Retrofitting drainage requirements to existing engineering infrastructure to incorporate water sensitive urban designs.	<ol style="list-style-type: none"> <li>Identify possible locations to site water gardens from stormwater management plans and stormwater quality and flood studies of municipality.</li> <li>Consider fit with Melbourne Water waterways and approvals required.</li> <li>Consider availability of funding grants from central government for proposed water sensitive urban design scheme to reduce cost to municipality.</li> </ol>	Each municipality engineering design department to take the lead.
Capital Planning		
Risk based decision making process for capital planning	Municipality specific	Each municipality business development section
Long term financial strategy developed for infrastructure works within municipality	Municipality specific	Each municipality business development section

## 6. Summary and Conclusions

The problem of an “infrastructure gap” is as real in councils in other countries as it is in Australia. Commonly it is found that the “infrastructure gap” exists, is continuing to grow and cannot be funded by traditional methods. Councils in various countries have differing approaches to meet the infrastructure gap and gain long term sustainability of their infrastructure.

The study visits cited from the study tour including cities in the countries of Canada, Northern America, Hong Kong and England show many aspects of operations that could be applied to Victorian Councils to meet the infrastructure gap and to improve performance of our assets in the areas of :-

- efficient management and maintenance of existing infrastructure,
- reducing consumption in the areas of sustainable transport strategies, performance of road pavements and sustainable stormwater management and sustainability in facility management,
- capital planning

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### Study Question No 1 - Efficient Management and Maintenance of Existing Infrastructure

Items found in the case studies that Victorian Councils can apply to improve efficient management and maintenance of their existing infrastructure are summarised in the following practical applications:-

- Development of a “whole of street replacement strategy” for each council matched to a funding strategy over a period of years. This will also require a co-operative approach to be developed with service authorities. This might be achieved by intensive negotiations with service authorities and alignment of service authority capital planning with that of council.
- Look at services council provides and the properties which they use in terms of the utilisation of these properties. Where under utilisation occurs consider integration of council services where possible in terms of facility portfolio management. Where possible co-locate community services such as children and family services, aged care services and sporting clubs in one building thus gaining greater utilisation of the councils building stock and freeing up properties for sale which in turn can finance the housing of the co-located services.
- Lobby the state and federal government for a higher percentage of fuel tax to fund road infrastructure and sustainable transport initiatives.





## Study Question No 2 - Reducing Consumption

*Sustainable transport strategies* developed within the councils studied as part of the study tour show many initiatives which can be applied to councils in Victoria. Some of these initiatives are summarised as follows:-

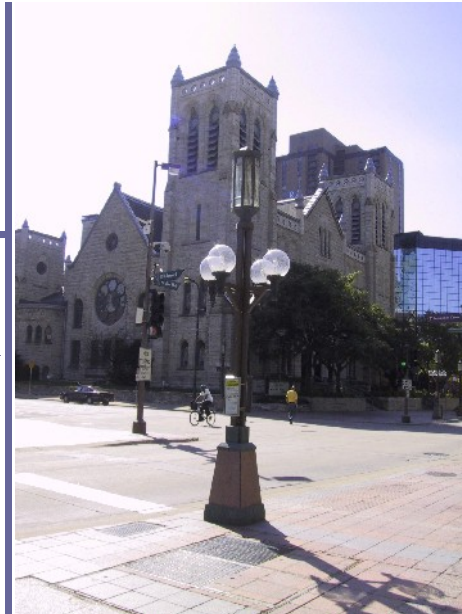
- Change of Behavioural initiatives which aim to increase modal share of alternative modes of transport to the private car. Travelsmart is an initiative of the State Government of Victoria which aims to increase modal share of alternative modes of transport to the private car by use of behavioural change techniques. Councils can tap into Travelsmart initiatives to further sustainable transport within their council.
- Co-operation with neighbouring councils in sustainable transport initiatives would increase the effect and gain a better outcome to traffic congestion
- Car pooling for council employees
- Set up a car sharing company for residents within the municipality
- Consider changing council fleet management practices to enable environmental emissions to be reduced.
- Ensure access for pedestrians using footpaths within the city are in good condition and that tram crossings are appropriately placed so that the city can be traversed by pedestrians by all. Any maintenance issues found should be incorporated into the maintenance program.



- A cyclic maintenance program should be considered mandatory for footpaths.
- Consider development of a bike path strategy for the city that gives opportunities for all to cycle to activity centres. There are a wide variety of lane types that can be used to make provision for cyclists including:-
    - Wide shared use footpaths
    - Bus/taxi/bicycle lanes
    - Contra-flow bike lanes on one way streets
    - Wide kerb side lanes
  - Provision of bicycle racks on the front of buses
  - Traffic lights that have a count down facility for pedestrians crossing the road showing how many seconds left to cross the road.
  - Community traffic management plans designed to make the streets safer for all road users and providing better amenity for residents by using a mixture of engineering treatments, education and enforcement strategies.
  - Guidelines developed for new construction considering walking and cycling needs and developer requirements are placed for walking and cycling.

*Sustainable Stormwater Management* initiatives identified during the study tour which can be applied to Victorian municipalities include:-

- Wetlands to improve stormwater quality, provide recreational service for residents and habitat for birds
- Water gardens to improve stormwater quality and retard flows
- A range of water sensitive urban designs retrofitted to existing engineering infrastructure such as traffic islands
- Water re-use schemes by collection of stormwater and reusing for cooling of buildings.



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### **Study Question No 3 - Capital Planning**

Initiatives used within the study visits which could be applied to capital planning processes within Victorian Councils include:-

- Develop a risk based decision making process for capital planning to assist in identification and recommendation for funding the greatest needs.
- Ensure a long term financial strategy is developed for infrastructure works within the municipality.

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### **Conclusion**

Similar problems of infrastructure are evident in all countries visited. The study visits produced many initiatives which can be applied to the management of asset infrastructure in many Victorian municipalities.

## **7. Acknowledgments**

Firstly and foremost my thanks goes to the Municipal Engineer Foundation of Victoria (MEF) for the opportunity to participate in this study tour and for the scholarship granted to pay expenses for the study tour. I feel honoured to have been awarded the scholarship and proud to represent Australian Municipal Engineers overseas. A special thanks to Mr Keith Wood, who travelled as the group representative from the MEF Board of Directors, for his advice and assistance with introductions to appropriate members of American Public Works Association able to assist in furthering aspects of my study topic. Also to Mr Robin Nuttal, from the MEF Board of Directors, I extend my thanks for his assistance in presentation of this report.

I would also like to thank the Study Tour Leader, CEO of IPEA, Mr Chris Champion for organising the tour itinerary, making sure we achieved all travel connections and study visits, whilst keeping the positive motivation of the group in constant motion.

I would also like to thank the other study participants who shared the journey of learning through the countries and their own discoveries within their area of study.

I am in debt to all the officers from the six local authorities visited who gave up their time from busy schedules to offer hospitality, resources and technical advice on my study tour topic and without whose co-operation the tour would not be possible.

Thanks to my colleagues at the City of Boroondara who proof read my study report and patiently listened to the many operational discoveries I made overseas and discussed with me how to advance them within the Victorian local government context and within the City of Boroondara in particular.

Thankyou to my family for allowing me the time to participate in the study tour and indulge my search for better ways of tackling engineering problems in this area of study.

## APPENDICES

APPENDIX A – Study Visit No 1.– Cyberport, Hong Kong

APPENDIX B – Study Visit No 2 – City of Edmonton, Alberta, Canada

APPENDIX C – Study Visit No 3 – City of Calgary, Alberta, Canada

APPENDIX D – Study Visit No 4 – City of Minneapolis, Minnesota, North America

APPENDIX E – Study Visit No 5 – City of Eden Prairie, Minnesota, North America

APPENDIX F – Study Visit No 6 – Brighton and Hove City Council, UK

## APPENDIX A - Study Visit No 1 – Cyberport, Hong Kong

Visit: Saturday 3<sup>rd</sup> September 2005

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### Context

Cyberport is located at Telegraph Bay on Hong Kong Island's southern side. It is located 15 minutes from the central business district and 35 minutes drive from the international airport. It is situated on the waterfront and has great views of the ocean.



Cyberport is a project which aims to create a creative and interactive environment that will be home to a strategic cluster of more than 100 IT companies and over 10,000 IT professionals. It comprises a deluxe residential development, a five star hotel, a retail and entertainment complex and state-of-the-art IT/telecoms facilities intelligent office space.



The project is estimated at \$2 billion US and employs 18 staff.

Cyberport is a joint project between the developer and the Hong Kong government. The government provided the site to the developer at a cost of \$7 billion HK in 1997 and a 50/50 share basis of profits is to be realised between developer and government. It can be likened to a municipal council as it provides all its own services.



Hong Kong has a population of some 7 million people.

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### Efficient Management and Maintenance of Existing Infrastructure

The approach to infrastructure management and maintenance is to replace all infrastructure routinely on a planned basis. For example it will cost \$500 million to upgrade the IT system over a 5 year period. This amount of money has been allocated within the maintenance fund.





Construction methods differ from those found in Australia. Scaffolding is bamboo. More labour is used than machinery for some construction tasks. Materials are moved via barge making use of the seafront access to the site.



The infrastructure is replaced at the appointed “end of life” time whether or not it is defective.

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## Reducing Consumption

### *Sustainable Transport*

Cyberport is a public transport interchange and has good public transport services to the area. Provision for parking of 800 private cars has been made on the site. The culture of catching public transport is widespread and helped by the expensive cost of fuel.



### *Sustainable Buildings*

The lighting within the buildings is energy efficient. The lift operation is energy efficient. Tenants are given lessons in energy efficient use of their building space.

### *Sustainable stormwater management*

Stormwater is collected from buildings and reused in the cooling towers of the building. There is also a prominent water feature in the communal grounds area which uses re-used water.



### *Consultation*

Consultation was required with a group of residents nearby the developed. Monthly meetings are held with the residents who habitually complain about noise and air quality issues relating to construction.

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## Planning

### *Capital budget processes*

The development is constructed in stages with the sale of one stage funding the construction of the next. The project will return to the government once completed and all profits have been realised.

A maintenance plan for all infrastructure has been included within the funding plans.

## APPENDIX B - Study Visit No 2 – City of Edmonton, Canada

Visit: Tuesday September 6<sup>th</sup> 2005

### Context

#### *Location and Population*

The City of Edmonton is situated close to the Rocky Mountains and Jasper State Forest within the oil rich Province of Alberta in Canada and has a population of over 800,000.

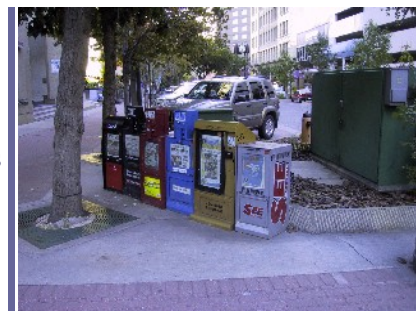


#### *Budget and Funding Sources*

The City has an annual operating budget of about \$1,200 million US and a capital budget of some \$600 million of which between \$300 and \$400millionUS is spent on infrastructure. Services provided within this budget include Police (16%), Fire rescue (12%), Transit services for bus and light rail (14%), Roads (6%), Snow removal (4%), Parks and communities (10%), Public libraries (3%), Capital project funding (11%), Waste removal and recycling (2%), Building (3%), Internal support (9%), Tax Debt (1%), Other (9%). In addition sanitary and land drainage services are provided through separate businesses of the local government authority. The total equivalent full time staff for the city hovers around 1,650.



Revenue is collected from a municipal tax, waste management fee, sanitary utility fee and land drainage utility fee. In addition the city receives in the order of \$600million funding from the Provisional Government of Alberta and \$300million from the Federal Government of Canada. Since the province is oil rich some taxes collected from oil are placed back into transportation projects through the vehicle of local government.



### Infrastructure Problems

Much of the infrastructure is reaching the end of its serviceable life with some sewers being built over 100 years ago. The average age across all asset classes is 30 years with the average expected life across all asset classes being 50 years. The total replacement value is estimated at \$19.4billionUS with roads and drains being the largest asset classes in terms of making up 40% and 31% of replacement value respectively.

Edmonton has a significant infrastructure gap between capital needs and financial resources. The level of spending on rehabilitation works is about half that recommended by the national authorities which recommend an annual spend of approximately 2% of replacement value per year on rehabilitation works. This means that the gap continues to increase. Other contributing factors to the gap increase include continual aging of the infrastructure, backlog of unfunded projects, demand for new infrastructure, escalating construction costs and stringent environmental regulations.



## Efficient Management and Maintenance of Existing Infrastructure

### *Strategic Asset Management*

To meet the infrastructure gap the city has adopted 15 strategies with the aim of ensuring that the city's infrastructure is in good state of repair and that rehabilitation and repair programs are adequately funded on an ongoing basis and are efficient and effective as possible. In development of the asset management strategy the city looked at what assets they owned, what it was worth, what is the average age of the infrastructure, what is the condition of the infrastructure and what needs to be done and how much will it cost. When considering the condition of the infrastructure the physical condition, functionality and demand/capacity is taken into consideration enabling the levels of service to be lined to asset management strategies and processes.



### *Asset Management Tools*

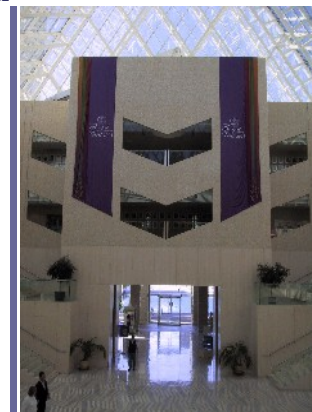
Tools and processes used by the City of Edmonton in asset management include:-

- Risk assessment of each of 12 asset classes to determine their current condition, make predictions concerning condition and expected failure and the consequence and severity of that failure. Life cycle costing
- Levels of service linked to asset management strategies and processes

### *Best Practice Examples*

By using a risk assessment approach the following benefits arise:-

- a quantitative approach for use in strategic planning and in macro life cycle analysis,





- identification of infrastructure area with emerging issues and the need to increase inspections and assessment programs in these areas,
- identification of areas that involve significant exposure to the city.



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## Reducing Consumption

### *Sustainable Transport Strategies*

Edmonton has an “Active Transportation Program” with many initiatives within the program including

- Travel Demand Management
- Accessibility
- Trails and cycle paths
- Community traffic calming.

Travel Demand Management and aims to increase modal share of alternative modes of transport to the private car. A household travel and bicycle survey is undertaken regularly and equates to the Travelsmart program recently undertaken as a pilot study along the Alamein train line within Boroondara (Victoria, Australia) where a modal shift of 27% to public transport, 23% increase in cycling trips and 26% increase in walking trips was realised whilst car driver trips were down 10 per cent. The Edmonton Travel Demand Management initiative has two phases with the first to develop travel options program for the employees of the City of Edmonton and the second to expand the program to target other major employers.



Under the program the City is looking at accessibility to sidewalks, trails, pram crossings and wooden stairs and any issues identified are programmed into annual rehabilitation.



Guidelines for new construction consider walking and cycling needs and developer requirements are placed for walking and cycling.

Edmonton is a busy city with a predominately car based network and many multiple lane streets. It has a good off road multi-trail system providing both commuter and recreational use for cycling, skating and walking. The trails are both made and unmade and are generally wider than those found within a Melbourne inner city council due to the need to cater for skaters. Walking accounts for 12% of total trips.



Initiatives undertaken to try and increase the current mode share of cyclists from its current 1.2% include:-

- Wide kerb side lanes have been provided throughout the city for use by cyclists by increasing the kerb side lane by an extra 0.5m where multiple lane streets are present.
- Within the inner city area a network of contra-flow bike lanes on one way streets has been established.
- Stairways within the city have been modified to make them more usable and improve overall cycle access between off road and on road systems.
- Provision of wide shared-use sidewalks
- Provision of bus/taxi bicycle lanes
- Provision of bicycle racks on the front of buses
- Construction of a multi-use trail adjacent to the light rail



Community traffic management plans are designed to make the streets safer for all road users and providing better amenity for residents by using a mixture of engineering treatments, education and enforcement strategies.



#### *Performance of Road Pavements*

A pavement management strategy has been adopted for the municipality. Performance of pavements is evaluated by use of a pavement quality index comprised of a surface distress index, ride comfort index and structural adequacy index. The pavement is then optimised. A co-ordinated transportation and streets program has been developed considering the need for pavement rehabilitation, drainage renewal, sewer and water main and other services within the street.



#### *Sustainable Stormwater Management*

Wetlands have been developed. The Study group undertook a field visit to one of the wetland areas recently built. Water gardens are apparent in certain areas.

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## **Planning**

### *Long Term Funding Plans*

Over the next 10 years a long range financial plan has been developed and it shows that \$3billion of infrastructure works can be funded but that \$4.1billion of

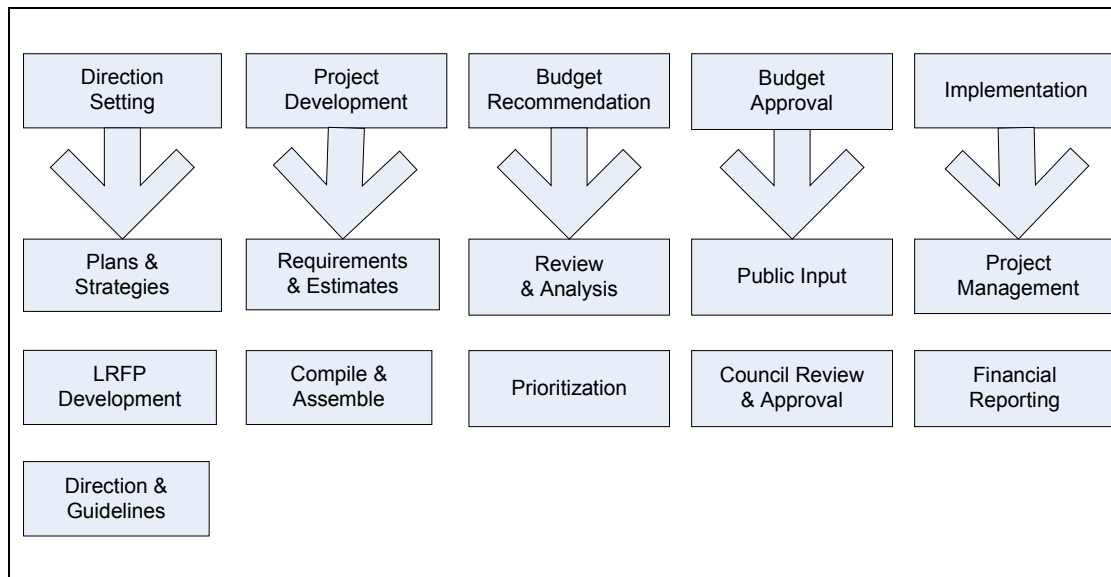
infrastructure needed works cannot be funded. This can be analysed as 59% for renewal works, 30% growth needs and 11% other needs with the greatest proportion of funding required within the roads and drainage program sectors with lands and buildings and mobile plant and equipment the next highest program sectors.

Of the unfunded \$4.1 billion infrastructure needed works 37% is calculated as deferred renewal works, 61% as growth needs and 2% as other needs. The greatest proportion of unfunded needs lies in the program sectors of roads and transit facilities.



*Capital Budget Process*

The capital budget process can be broken down into a series of steps as shown in Figure B1 below.





## APPENDIX C - Study Visit No 3 – Calgary City Council, Canada

Visit: Friday 9<sup>th</sup> September 2005

### Context

#### *Location and Population*

The City of Calgary is situated on the Prairie close to the Rocky Mountains within the oil rich Province of Alberta in Canada and has a population of over 1,000,000. The municipality has the largest concentration of head offices in Canada and is one of the fastest growing cities in Canada. The municipality employs 13,000 municipal staff.



#### *Budget and Funding Sources*

The City also provides such services as police, fire rescue, transit services for bus and light rail, roads, snow removal, parks and communities, public libraries, capital project finding, waste removal and recycling, buildings. In addition sanitary and land drainage services are provided through separate businesses of the local government authority.



Revenue is collected from a municipal tax, waste management fee, sanitary utility fee and land drainage utility fee on a similar basis to that at Edmonton. In addition the city receives funding from the Provisional Government of Alberta and from the Federal Government of Canada. As is the case in Edmonton since the province is oil rich some taxes collected from oil are placed back into transportation projects through the vehicle of local government.

#### *Assets*

The number of assets owned by City of Calgary is impressive compared to typical Melbourne Councils including 13,000km of roads, 84km of light rail track, 1,000 transit vehicles, 8,200 Ha parkland, 400km of pathways more than 1,200 buildings, more than 2,000 vehicles, water and wastewater treatment facilities together with water, sewer and stormwater pipelines.



### Infrastructure Problems

The total asset base value is estimated at \$28billionUS at current replacement values. Water and wastewater assets account for over half of the asset base value

with roads dominating the remaining asset base value. An average condition rating across all asset groups is “good condition” based on physical condition, demand/capacity and functionality. Inflation, stringent environmental legislation, construction capacity, service demand and aging infrastructure have resulted in an “infrastructure gap”, the funding shortfall to meet Calgary’s infrastructure needs. An infrastructure gap of some \$5.3billionUS has been determined of which \$7.7billionUS is funded and \$5.3billion is unfunded.

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## Efficient Management and Maintenance of Existing Infrastructure

There is no immediate foreseeable funding available to fund the “infrastructure gap” so Calgary has employed the following strategies:-

- A risk based decision making process for capital planning to assist in funding the greatest needs.
- A “whole of street replacement” concept which they are able to do as there is no need for co-ordination with service authorities as is the case in Melbourne but rather co-ordination between service units of the council. For this to work in Melbourne the risk apportionment between council and service authority would need to be considered.
- Look to integrate services where possible, especially as they apply to facilities management.
- Lobby the provincial government for a higher percentage of fuel tax to fund road infrastructure/ sustainable transport initiatives.



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## Reducing Consumption

### *Sustainable Transport Initiatives*

Calgary has developed a travel demand study which details initiatives for sustainable transport. This document is available from their web site. Of particular note is that Calgary City was able to implement a travel behaviour change program that held the rising congestion levels during the am and pm peaks constant, deferring the need to build more freeways to increase road capacity. The behaviour change program targeted the larger businesses within the CBD area. The businesses considered employee staggering of start and finish times, looked at working from home options for employees and areas where trips could be cut amongst other initiatives which had a significant impact on traffic congestion.



## Planning

### *Capital Planning*

Calgary has developed a Capital Project Matrix used for all projects in excess of \$200,000. The matrix uses a risk based approach to score the projects in terms of meeting a range of criteria including those related to legislative and other compliance, asset management, Triple Bottom Line principles, financial benefit and public benefit. Projects are defined in terms of Maintenance, Growth or level of Service. The project is allocated an overall score used for prioritising and rating projects across Council.

This is similar to other approaches employed in prioritising Capital Programs that are structured and systematic. In addition to the matrix a Project Readiness Statement is required for each proposed project designed to filter out those projects not physically able to be delivered within a prescribed time frame, regardless of its priority.



**Figure C1** - Annual Capital Budget Process

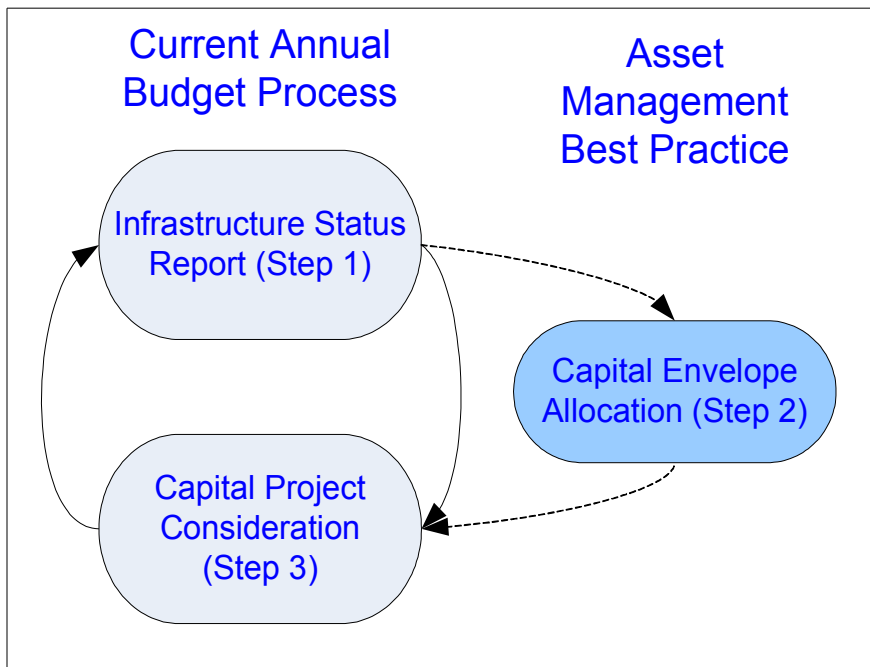


Figure C2 - Capital Budget Business Cases and Process

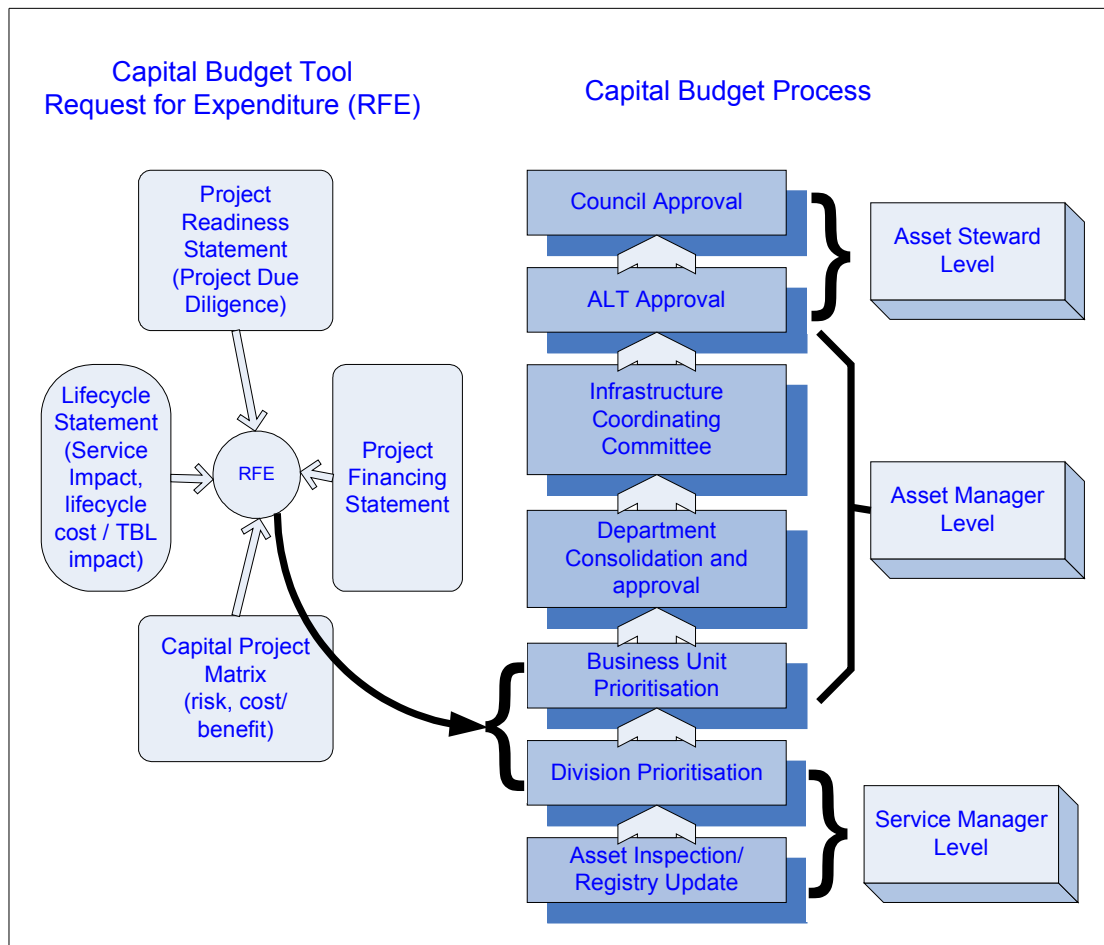
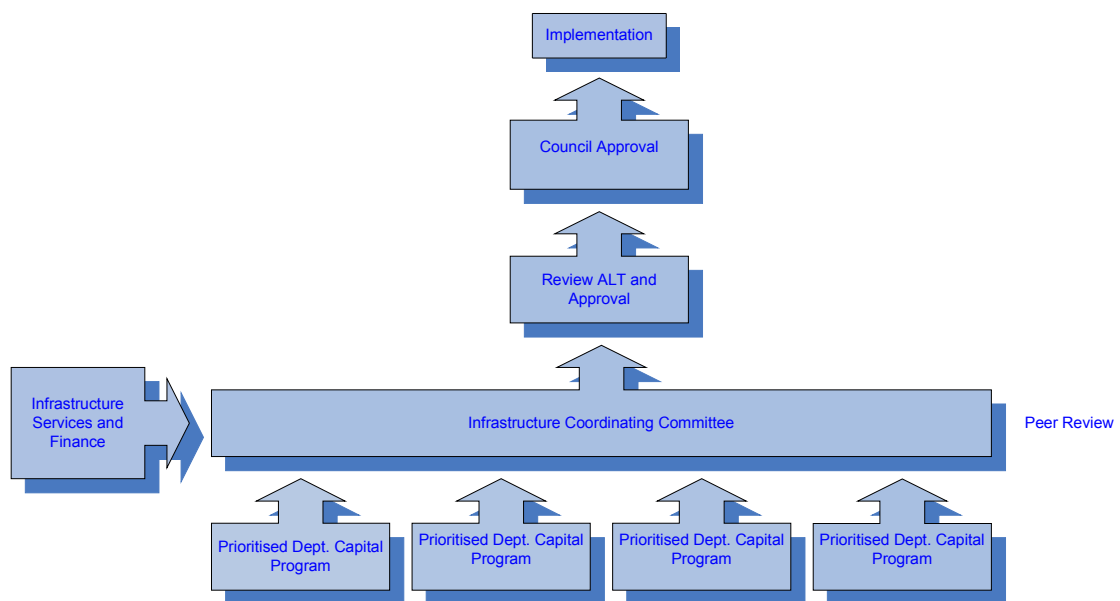


Figure C3 - Capital Budget Governance



## APPENDIX D - Study Visit No. 4 – City of Minneapolis, Minnesota, North America

Visit: Thursday 15<sup>th</sup> September 2005

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### Context

The City of Minneapolis has 13 council members and a mayor who is elected at large. Its structure and governance cannot easily be compared to that of Australian councils. A defused decision making system is evident so one department head cannot do anything without the approval of the other departmental heads. The divided power structure enables collaboration but means that it takes longer to get things done. Even though there are great differences in the organisational and governance systems and in the services provided the same infrastructure problem prevails – that of an infrastructure gap and marginal means of financing the gap.

The city has a staff of 4,500 employees.

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### Efficient Management and Maintenance of Existing Infrastructure

Historically infrastructure management and maintenance was functionally focused. Currently the organisation is in the process of implementing a change in its approach to incorporate provision of services by establishing indicators and initiatives.

Financing by the private sector of infrastructure renewal and ownership of some of the departments of the council has been investigated.

A resident survey is undertaken every two years.

Most residents are pleased with the cleanliness of the city. Garbage collection is undertaken partly using internal staff and partly outsourced thus creating competition. The department is responsible for co-ordination. Strong action is taken on graffiti and posting of bills to maintain the clean image of the city. Cleanliness of footpaths is the responsibility of the abutting property owner, even down to taking the chewing gum off the pavement with the council responsible for sweeping kerb to kerb.





Minneapolis has a system of skyways which enables movement between city buildings under cover all year round. There are various maintenance arrangements for portions of these skyways.



Within the business community there are special service districts that inform the council about capital improvements to the district. These capital improvements are financed by the business community if they are over the base service standards specified by the council.

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## Reducing Consumption

### *Sustainable Transport*

Council has a 10yr transport action plan outlining actions for the next 10 years to produce sustainable communities for the next 50 years.



Parking presents a challenge for sustainability in juggling the three goals of managing parking to encourage use of public transport, supporting development and making revenue.

Downtown transportation objectives include keeping it walkable and development of a fringe parking system.



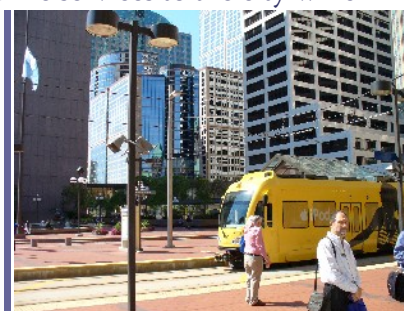
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## Planning

### *Capital budget processes*

Mayor puts together the budget and the council has the power to change it to a limited degree. The Mayor has six personal staff and works with the budget office and in budget development.

Much of the budget is dedicated to the police and fire services to the city which are controlled by local government. Much of the budget is derived from existing property taxes, gas tax and grants.



### *Long term Funding plan*

The budget is currently developed on a yearly basis with justification required for all budget requests. This has created many problems. There is a move to a whole of life costing system.



There is a comprehensive long term plan for the city developed under a set of strategic goals. This plan is due for modification and discussion in 2008.

Public vs private ownership is considered for many aspects of infrastructure funding within the council.



## APPENDIX E - Study Visit No. 5 – City of Eden Prairie, Minnesota, North America

Visit: Thursday 15th September 2005

### Context

The City of Eden Prairie is located on the outskirts of Minneapolis within the state of Minnesota and has a population of some 55,000. It is a fairly new suburb having grown from a farming community in the 1960's to the predominately residential city with associated commercial centres of today. 67% of households have cable access and 90% of households within the city have internet access.



There are only 4 roads that allow through traffic through the City. The City layout is predominately cul-de-sac for residential areas. There are 16 lakes and many marshy areas within the city requiring rigorous stormwater systems including stormwater retention ponds.



The annual budget for opex, capex and utilities is in the vicinity of \$75million.

The CEO reports to a 5 member council (including the Mayor) which is elected on a 4 year term.

### Efficient Management and Maintenance of Existing Infrastructure

The plan for the City was developed in 1968 with the first sewer being laid in 1977. During the first 20 years of the City's development the proportion of residential properties was low and there was no need for sidewalks so only 20% of residential areas now have sidewalks. Children play in streets and many of the residential streets are cul-de-sac in nature. It is considered best to share the road for pedestrian access.



It is difficult to compare aspects of budget, organisational set up and operations with those of an Australian council as the services rendered by the City of Eden Prairie incorporate fire services and police as a major part of the budget. This may explain why it appears that strategic management of existing infrastructure assets is not as well progressed as that found in Australian and Canadian municipalities

A visit to inspect the mechanical workshops maintenance facility was undertaken by the Study Group. This facility is well located for the city's operations. It was well planned with foresight and the industrial land purchased in the 1980's. The buildings were constructed using convict labour or "sweat equity" resulting in significant labour savings on construction of the buildings.



One computer system observed during the visit to the workshops involved the logging of information by workshop mechanics relating to vehicle repair and servicing directly onto the computer. This is an excellent way of tracking repair time, repair history and spare parts (which are entered via a bar code scanner) without the need for paper based systems which are often inaccurate and which require double handling of information.

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## Reducing Consumption

### *Sustainable Transport*

- The highway leading into the City of Eden Prairie has signage in the reservation detailing a number to ring to access a car share ride.
- Transit lanes are also provided along the major highways to facilitate the passage of certain vehicle types through the city at peak times.
- Footpath or sidewalk access was observed to be a problem within the City. Footpaths are not provided on all residential streets resulting in pedestrian accessibility problems. Footpath maintenance is the responsibility of the landowner abutting the street and this includes freeing the pathway of ice during the winter months. It is predominately for this reason that residents are not generally in favour of footpaths in residential streets. There is also a very high car usage rate which is again not encouraging the pedestrian traffic.
- The City makes use of their web site to give real time travel information to residents visiting the site. Through a permanently placed traffic camera one can view the traffic congestion on the roads and access information relating to any road closures



### *Sustainable stormwater management*

There are many examples of wetlands within the City of Eden Prairie.

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## Planning

### *Capital budget processes*

Police Services has the largest dedicated section of the budget with Fire Services the next largest section. Within the infrastructure assets the parks and recreational section has a large slice of the budget as presentation is an important service component to the City. The majority of income for infrastructure works is derived from a property tax levy and fees.

### *Long Term Funding plan*

The council has a capital improvement plan which is published on the web site.

### *Corporate Governance*

Communicating infrastructure works is a very important aspect of service within the City of Eden Prairie. Some ways communications are achieved are as follows:-

- The CEO uses a “BLOG” on a daily basis as part of the communication strategy with the residents. “BLOG” is short for web log and is a web page linked to the Council web site. The BLOG focuses on employee and community issues that are current and may be of interest to the community at large. It is updated on a daily basis.
- All council meetings are shown live on TV. The media, especially TV, is used to profile infrastructure initiatives





## APPENDIX F - Study Visit No.6 – Brighton and Hove City Council, UK

Visit: Tuesday 19<sup>th</sup> September 2005

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### Context

Brighton and Hove City council is located in the south of England, a good hours train journey from central London. The Council services 250,000 residents with 4% of the population being students. The council has some 8,000 staff of which approximately 4,000 are in education. The capital budget is about £50million and revenue budget is £280million with the gross budget approximately £500million. Approximately 80% of spending comes from grants. These grants are derived from preset formula eg length of road per number of people. The remaining 20% comes from council tax. National Performance indicators are set which all councils are measured against.



The services delivered by English councils differ to those provided by Australian councils in that education, public housing, hospitals and policing are included within the English councils service provision. In order to deliver these services Brighton and hove city council has formed several Directorates. We were privileged to be given presentations by the director of environment and CEO. The Director of Environment is responsible for transport, planning, parks and open space and community safety.



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### Efficient Management and Maintenance of Existing Infrastructure

#### *Road Maintenance.*

There is a nationally agreed test for roads to give a condition rating. This is used for bidding submissions to central government. Currently there is an estimated £42million deficit in road maintenance funding to get roads to the acceptable service condition.



## Reducing Consumption

### *Transport Strategy*

Brighton and Hove Council are well known for their innovation in the transportation area being awarded the Transport Authority of the Year Award. They have developed a 5 year transport expenditure plan based on modal shift. The main objectives of the transport strategies for the council are to get people on buses and to control parking. The challenges include the constraints put on development and the narrow streets with congestion and air quality major concerns. Currently 37% of people in Brighton do not have cars compared to 19% of people who do not have cars in Southern England. 41% of people in Brighton and Hove City Council travel to work without cars compared to 23% of people in the rest of southern England. 12.5% of people in Brighton travel to work on buses compared to 4% for the rest of Southern England.



Parking permits are required by residents who require on street parking and are quite expensive. A parking permit would cost a resident £80 per year.

A partnership has been developed with the bus companies with the aim of achieving 50% patronage increase by 2010. It is expected that 10 buses will be added per year. The main ingredients of the bus strategy include:-

- Bus stop improvements to the design
- Real time information displays
- Enforcement

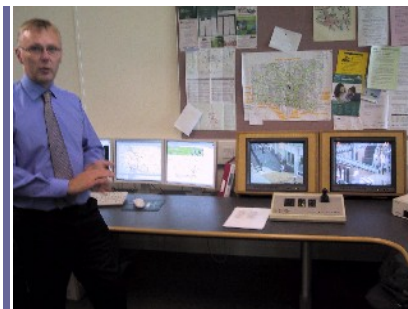
The customer satisfaction survey found that safety is the number one reason why people do not travel on the bus and the second was lack of information. Park and ride schemes have been implemented on the fringe of the city centre.

A Car Club concept is currently being used. The requirement is incorporated into all new developments so that each person does not need to own a car.

### *Transport Control Centre*

The transport control centre manages the bus fleet and road system. The control centre has the ability to change the traffic lights to try and react to problems causing bus delays. The centre will also set messages on the real time information displays at bus stops detailing any delays and when the next bus is due to arrive. The centre also gives notification of how many parking spaces are available in the public car parks on the car park real time information system.

There are 50 cameras in the city set up for crime and safety rather than for traffic monitoring. However, these cameras can be used to monitor traffic congestion





and are displayed at the transport control centre and used to give road information to public transport buses and manage the road system.

### *Waste*

The requirement for recycling and waste reduction is driven from Europe.

Brighton and Hove had a lot of quarries to use as landfills but these are filling up fast. By 2010 the aim is to reduce landfill waste by 75% from 1995 levels or the council will be fined. Waste production is currently increasing at a rate of 3-4% which is higher than GDP. Currently 30% of waste is recycled. The council has a green waste collection, a recycling collection and other rubbish. Communal systems for rubbish collection from flats is required as the provision of a wheelie bin for all households in impractical for placement in the street on collection day would render the street impassable.



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## **Planning**

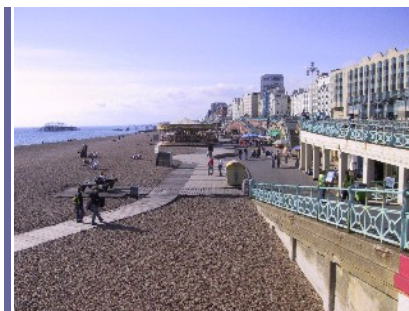
### *Capital budget processes*

Capital budget centres around levels of service and demand for service and has set criteria. Taxes are collected by the local government authority and given to central government who then redistribute funds to all councils throughout England. Funding allocated depends upon the ability to meet performance objectives and targets, especially in the areas of transport and education.

### *Governance Systems*

The governance system is quite different to that found in Australia. Brighton and Hove Council has 54 Councillors and 26 Wards. Some Wards have 2 or 3 councillors. It is a party political council with 23 councillors supporting labour, 20 supporting the conservatives, 6 for the greens, 3 liberal democrats and 2 independents. This forms a committee administration

Most councils in England are usually run using the cabinet style of governance where the cabinet has powers but this is not so at Brighton and Hove. Brighton and Hove have a committee system with 6 committees. Councillors share chairmanship of committees.



The major challenge for the administration is to develop strategic thinking with councillors and council groups.

*Management Style*

To assist the CEO in achieving the councils PI's he sets a performance compact with each of his directors in the following areas:-

- General management of staff (manage within budget and sickness levels etc)
- Equalities
- Customer service
- PI's are given for directorate specific elements such as recycling, speed of determining planning applications within the environment directorate
- Milestones are also set for achieving certain projects
- He also sets a behavioural component – what do good leaders do? How do they get motivated? Assesses how directors might manage against these criteria. He gives them a 360degree review using a consultant.

