

2012 ASSET MANAGEMENT

'LIVEABILITY' A FURTHER DIMENSION
FOR ASSESSING LEVELS OF SERVICE

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2 Forward

The Municipal Engineers Foundation Victoria sponsored a group of four delegates (three engineers and one team leader) to attend the International 2012 Federation of Municipal Engineers (IFME) conference in Helsinki, Finland. The sponsorship also included a study tour to visit various local government areas in Scandinavia and Europe.

The conference itinerary included visits to the Cities of Stockholm and Tallinn. As part of the study tour a number of municipal visits were also organised at the following European cities:

- Helsinki (Finland)
- Tallinn (Estonia)
- Stockholm (Sweden)
- Malmö (Sweden)
- Staffanstorp (Sweden)
- Copenhagen (Denmark)
- Rudersdal (Denmark)
- Munich (Germany)
- Zurich (Switzerland)
- Vienna (Austria)

The three engineering participants developed study topics as part of the sponsorship selection process. The study topics are briefly described by each of the participants:

- *Simon Thomas*

The study topic looks at the works and services perceived as being essential to creating a liveable city, according to communities. The study aims to include cities across Europe that have been highlighted in American and British studies as being among the top 10 Most Liveable Cities. These include Helsinki, Copenhagen, Munich, Vienna and Zurich.

- *Oliver Vido*

The study topic looks at what tools are used to engage the community in the delivery of services and public infrastructure. The topic will focus on the use of social media tools in the active engagement of communities to determine the service needs related to public works infrastructure.

- *Cohen Van der Velde*

The study topic explores the way in which European municipalities plan and deliver capital works and how the European debt crisis has affected their ability to deliver on these plans.



MEFV Theme

A theme was subsequently developed by the MEFV for the Study Tour based on the study topics:

'Delivering Public Works during a Global Economic down-turn, Tools used to engage the community in the delivery of services and public infrastructure, and the What the community perceives as those works and services that are essential to creating a liveable city'.

A number of the cities were chosen on the basis that they had been highlighted in various British and American studies as being amongst the top 10 Most Liveable Cities in the world. (Refer to Attachment 15.1.) The process for selection of the cities is described fully in the body of the report.

3 Executive Summary


Local Government in Australia has approximately \$212b in assets and infrastructure under management. (Source: Municipal Association of Victoria – MAV.) At a State level, Victorian Local Governments manage \$55b worth of community infrastructure and assets (Source: MAV) including; buildings, roads, drains, bridges, footpaths, playgrounds, sports fields, parks and reserves, and street furniture. Councils have an obligation to ensure that sufficient funds are provided in their Strategic Resource Plans to ensure that these facilities are maintained in a safe and serviceable condition in the long-term to meet defined service standards.

Councils also have an obligation to ensure that they manage all assets on a life cycle basis with full knowledge of the social, environmental and financial costs, benefits and risks associated with that asset. Asset Management is concerned with managing each phase of an asset's life from inception through to disposal.

Local Government also has a role within a broader context of local leadership on key strategic issues and in influencing the quality of life or health and wellbeing of residents. Councils are in a prime position to influence community behaviour and achieve these outcomes through interaction with local residents.

At a municipal level, Asset Managers tend to concentrate on the planning, delivery, management and maintenance of infrastructure assets that are responsive to local needs. The quality of these assets has a large bearing at a regional, national and international level in terms of the perception of what is a desirable place to live.

The concept of 'liveability' is used to describe the overall contribution of the urban environment in influencing to the quality of life or health and wellbeing of residents. (Source: *Enhancing Victorias Liveability' Urbis February 2008.*)



Liveability is measurable. There are a number of international studies conducted on an annual basis which assess liveability and quality of life. The City of Helsinki was rated as the world's most liveable city 2011, by *Monocle*, a UK-based magazine, in its Quality of Life survey, which ranks the top 25 cities in the world to call home. Zurich and Copenhagen were rated at number two and three respectively. Concurrently, The Economist Intelligence Unit, part of *The Economist*, a US-based magazine, rated Melbourne as the most liveable city 2011 (and 2012) based on an evaluation of 140 cities worldwide, narrowly beating Vancouver. The Mercer Quality of Life Survey is another source of information on the concept of 'liveability'. This survey ranked Vienna as number one for 2011.

Infrastructure and Liveability

Reports prepared for the Victorian Competition and Efficiency Commission identify a number of physical attributes of a place that contribute to liveability. These reports identify the amenity of places as contributing to the overall enjoyment of residents or visitors and to the sense of place and belonging in a community. They also identify the urban environment as being important in terms of facilitating the satisfaction of human needs and providing high levels of wellbeing.

Liveability is an important measure as it is argued that cities are generally more competitive in an economic sense where liveability and community wellbeing are the primary goals. It is further argued that the liveability of a city contributes to its competitiveness as it draws the best human talent.


Given the importance of liveability, it is valuable to understand those elements of the urban environment that contribute to facilitating the satisfaction of human needs and providing high levels of wellbeing. Assessing the criteria used in the surveys and previously mentioned reports, it is evident that from an infrastructure maintenance perspective, the key elements that affect liveability include:

- Built infrastructure
- Amenity and Place
- Environment and Sustainability
- Transport and Mobility
- Innovation.

From an asset management perspective, the assessment criteria used in the above studies provide a valuable insight as to what is considered as being important from a physical infrastructure perspective.

Integrated Urban Planning

The European cities visited were all experiencing rapid population growth. The success of these cities in dealing with population pressures was largely achieved through the integration of land use planning, urban design and infrastructure planning.



Many of the cities are responsible for both setting planning policy and acting as the planning authority. In addition to this, many of these cities provided a broader range of services including hospital/health facilities, educational facilities and public transport. This provides the opportunity to coordinate and integrate the planning, provision and maintenance of infrastructure.

All cities had extensive frameworks for guiding urban development and associated density/development controls similar to Victoria. From an asset management perspective many of the frameworks included extensive policy/strategy regarding elements such as urban and public spaces, open space provision and management, transport/mobility, and environmental sustainability. It should be noted that these elements of the strategic frameworks align very closely with those elements of the urban environment identified as being important from a liveability perspective, as outlined previously.

Cities such as Copenhagen and Munich require up to 40 per cent open and urban public space for new developments and up to 14m² per person of open and urban public spaces for new developments respectively. From a mobility perspective, many cities have integrated mobility/transport strategies and policies as part of their urban planning framework. For example, Copenhagen has adopted a 'Green Mobility Strategy' as part of its urban development framework and boasts that 68 per cent of daily commutes are made by walking, cycling or public transport. Many of the cities also had very ambitious energy/carbon reduction targets in place which drive innovation in new development terms of the built form, density, material types, urban renewal/recycling and energy provision. As an example, the City of Zurich has set a target, by public referendum, of reducing its carbon footprint from around 5tCO₂ per person to 1tCO₂ per person by 2050. These cities recognise the importance of built infrastructure, amenity and place, environment and sustainability, transport and mobility, and innovation. They also employ extensive policies and strategies as part of their urban development frameworks to ensure that their liveability will be maintained as further densification takes place.

Developments at Malmo in Sweden (Västra Hamnen) and the Royal Seaport Hjorthagen in Stockholm are cited as examples and demonstrate what can be achieved through an integrated planning and development process. These 'liveable' developments incorporate principles including socio-cultural, economic, technical, and environmental qualities which are important from a liveability perspective.

It is noted that Melbourne has been recognised in The Economist Intelligence Unit's survey as being the world's most liveable city in 2011 and 2012. However with the ongoing densification of the inner metropolitan area, the amount of open space per head is declining which in the longer-term will cause liveability to be eroded. Further comments from recognised industry experts suggest that the current patterns of urban development and urban sprawl will also reduce the liveability of Melbourne in the long-term.



Asset Management and Liveability

The Victorian State Government is moving towards adopting the National Framework for Asset Planning and Management for Victorian Local Government.

The National Framework is essentially an extension of the Victorian Municipal Association of Victoria (MAV) 'Step Asset Management Program' and includes nine elements:

- Asset management policy
- Asset management improvement strategy
- Governance and management arrangements
- Asset Management Plans
- Annual and long-term financial planning
- Organisational capacity
- Operational and asset management processes – data and systems
- Community engagement
- Levels of service

The national approach promotes prudent, transparent and accountable management of local government assets. It promotes a strategic approach to meeting current and emerging community needs.


Under the National Framework, councils are required to have an adopted Asset Management Policy, Asset Management Strategy and Asset Management Plans to inform the long-term capital requirements of the organisation.

A key requirement for meeting the national standard is that asset management plans have been developed with community levels of service being defined through community consultation, having regard to population and demographic change projections, trend analysis and customer feedback.

Liveability and Levels of Service

The key elements of 'Liveability' provide a quantitative reference for assessing service levels, and a broader framework for consideration as part of any community consultation process. The liveability criteria provide a higher order framework and enables benchmarking when assessing levels of service (e.g. a comparison between major world cities). While the criteria will differ for the different types of assets being assessed, it is possible to develop a 'model framework' which provides a guide on the criteria that should be used for the assessment of service levels.

A model framework has been adapted from a paper presented at the IFME Conference (The DGNB Certification System: New Mixed City Districts *by Anders S., Germany*). The 'model framework' identifies the elements to be assessed in the determination of service levels. The framework is grouped into four key criteria: Environmental Quality, Technical Quality, Economic Quality, and Socio-Cultural and Functional Quality.



The 'model liveability framework' can be used in the planning phase to ensure that a proposed initiative (strategy, service, capital project, etc), incorporates those features which influence liveability and provides a useful reference when assessing service levels (e.g. assessing how the delivery of those initiatives has influenced the quality of life or health and wellbeing of residents).

The process of establishing and reviewing service levels is critical for the purposes of asset management. As such it is proposed that the outcomes of the service level review be considered in the project/program/service planning phases of asset management as well as in the preparation of asset management plans. This ensures that there is a correlation between the evaluation/assessment and prioritisation of initiatives at the planning stage with the outcomes achieved through the delivery of those initiatives in terms of liveability.

Summary

Liveability is a largely subjective concept which relates in part to the overall contribution of the urban environment in influencing the quality of life or health and wellbeing of residents.

Several international studies measuring liveability and quality of life provide an insight into the factors affecting liveability.

Given the importance of liveability, it is valuable to understand those elements of the urban environment that contribute to facilitating the satisfaction of human needs and providing high levels of wellbeing.

From an asset management perspective the key elements of liveability provide a quantitative reference for assessing service levels and a broader framework for consideration as part of any community consultation process. A 'model liveability framework' has been developed which identifies the elements to be assessed in the determination of service levels. The framework is grouped into four key criteria: Environmental Quality, Technical Quality, Economic Quality, and Socio-Cultural and Functional Quality. The liveability framework can equally be employed in the planning phase and for the assessment of capital and service planning initiatives.



Recommendations

Having considered the concept of liveability, its relevance and how it can be assessed, this report makes a number of recommendations as to how liveability can be incorporated into land use planning, asset management, and capital planning processes at a local government level. The recommendations are briefly summarised into the following key areas:

1. To promote use of liveability criteria in the assessment of community service levels for asset management.
2. To integrate liveability criteria in to service planning for asset management.
3. To develop a strategy framework which provides an integrated approach to urban planning aligned with liveability objectives.
4. To integrate liveability criteria to support improved capital planning of public works.
5. To embed liveability principles into the day to day business of asset management.
6. To pursue amendment of Victorian Planning Policy through the preparation of the new Metropolitan Planning Strategy to link open space provision with development outcome for commercial and residential developments.



4 Introduction

4.1 Scope of the Study Report

At a municipal level, Asset Managers tend to concentrate on the planning, delivery, management and maintenance of infrastructure assets that are responsive to local needs including; roads, drains, urban spaces, trees and recreational facilities. The quality of these assets has a large bearing at a regional, national and international level in terms of the perception of what is a desirable place to live. The assessment process often loses sight of the overall contribution that these assets and facilities make to the amenity, safety and accessibility of the urban environment.

The performance of these assets is generally assessed using Technical Quality and Economic Quality criteria.

This study topic looks at what the community perceives as those works and services that are essential to creating a liveable city. The study includes cities across Europe that have been highlighted in American and British studies as being among the top 10 Most Liveable Cities. These include Helsinki, Copenhagen, Munich, Vienna and Zurich.

The provision and maintenance of public infrastructure has a large influence on the assessment of 'liveability', particularly in terms of aspects such as; the quality of the road network, access to public transport, regional/international links, provision of community facilities and open space, provision of recreation and cultural opportunities and facilities, community safety, energy and water provision/security, housing etc.

Adapting existing cities and infrastructure to meet changing demands, including population fluctuations; responding to environmental considerations such energy and water security, reduction and management of waste; and the impact of climate change, present significant challenges and opportunities for the planning, provision and maintenance of public infrastructure. Innovation is fundamentally important in adapting to these major imperatives, particularly in view of the current world economic climate.

The study provides a further insight into how leading world cities are adapting and managing their public infrastructure to meet key challenges such as climate change, and provide a further insight into the assessment of service levels for asset management purposes.



4.2 IFME Conference

The theme of the IFME World Congress was Sustainable Communities. The papers presented covered a broad range of topics. The keynote speakers addressed issues such as: The impact of the economic crisis on municipalities in Europe - which way forward? - Carl Haglund (Finland); Implementing Sustainable Infrastructure asset Management (SIAM) as part of a national program - Roger Byrne (Australia); The Swedish Delegation for sustainable cities - background, experiences and future opportunities - Ulf Rnahagen (Sweden).

Conference topics covered themes including: Construction and Renovation; Urban Planning; Municipal Design and Engineering; Asset Management; Traffic Solutions; Municipal Engineering in Estonia; and Energy Solutions.

The papers presented on urban planning, liveability, mobility management, and energy solutions provided a valuable opportunity to further explore the relationship between liveability and infrastructure, and provided many practical insights as to how major cities throughout the world are dealing with issues such as population increase, urban renewal, environment and sustainability.

The papers provide useful and highly relevant background material for this study topic. In particular, papers such as 'The DGNB Certification System: New Mixed City Districts' presented by Stephan Andres (German Sustainable Building Council); and 'Experiences from The Liveable City', presented by Ingelstrom A., Engstromc., Sweden, offered insights into broader principles for consideration in the design of cities and city districts in order to offer residents a high quality of life, while simultaneously maximising energy efficiency and minimising resource demand. The approaches in these papers use 'liveability' criteria to provide a comprehensive framework for the planning and assessment of development proposals, which is broader than a simple sustainability assessment. In particular the criterion used in the DGNB assessment system provides a useful reference for the development of a framework for the assessment of service levels for the purposes of asset management. A summary of these papers and a number of the more highly relevant papers is provided in the attachments.

4.3 Report Preparation

The following report has been prepared on the basis information provided at the IFME Conference, through the municipal visits and from other reference material cited in the Attachments (Section 15). A summary of the material covered in the interviews held at the municipal visits is included in Attachment 15.3.



5 Concept of Liveability

5.1 Concept

As a starting point it is worth establishing a working definition for 'Liveability'. Two relevant definitions used at Victorian State Government level are as follows:

1. *Liveability reflects the wellbeing of a community and represents the many characteristics that make a location a place where people want to live now and in the future. (A State of Liveability: An enquiry into Enhancing Victoria's Liveability, VCEC, 2008.)*
2. *The concept of 'liveability' is used to describe the overall contribution of the urban environment in influencing to the quality of life or health and well being of residents. ('Enhancing Victorias Liveability', Urbis, February 2008.)*

These definitions relate to a broad range of characteristics, including: community strength; economic strength; built infrastructure; social infrastructure; amenity and place; environment; citizenship; equity and human rights; participation; leadership and good governance; information and communication technology; transport; government services; and innovation.

5.2 International Studies


There are various independent surveys undertaken at an international level which provide an insight as to what contributes to 'Liveability'. Refer to Attachment 15.1 (Section 15).

The City of Helsinki was rated as the world's most liveable city 2011, by *Monocle*, a UK-based magazine, in its Quality of Life survey, which ranks the top 25 cities in the world to call home. Zurich and Copenhagen were rated at number two and three respectively.

Concurrently The Economist Intelligence Unit, part of *The Economist*, a US-based magazine rated Melbourne as the most liveable city 2011 and 2012 based on an evaluation of 140 cities worldwide, narrowly beating Vancouver.

The Mercer Quality of Life survey is another source of information on the concept of 'liveability'. Their survey ranked Vienna as number one for 2011.

The criterion used in each of the above surveys is discussed in more detail in the next section. It is interesting to note that there are a number of cities that appear in the top 10 in each of these different surveys. As such, it is useful to consider the criteria used for the assessment process by each of these sources, and how those criteria may be impacted at a local level by the planning, provision and maintenance of public infrastructure. A comparison of the relative ranking of the cities visited in



each of the above comparative surveys is presented in Attachment 15.1 (Section 15).

5.3 Liveability Criteria

Land use planning, urban design and community infrastructure have a key role to play in contributing to liveability. It is useful to consider the criteria used for the assessment process by each of these international studies, and how those criteria may be impacted at a local level by the planning, provision and implementation of public infrastructure.

5.3.1 The Economist Intelligence Unit - Liveability Survey

The Economist Intelligence Unit's liveability survey uses a robust methodology to assess each city against over 30 qualitative and quantitative factors across the following five broad categories: The detailed criteria are included in Attachment 15.4 (Section 15).

Stability (25%) - prevalence of petty crime, prevalence of violent crime, threat of military conflict, threat of civil unrest/conflict, threat of terrorism.

Healthcare (20%) - availability of public and private healthcare, quality of public and private healthcare provision, availability of over-the-counter drugs, general healthcare indicators.

Culture and environment (25%) - climate (humidity/temperature rating, discomfort to travellers, cultural hardship), corruption, social/religious restrictions, level of censorship, recreation (sports, culture, food and drink), availability of consumer goods and services.

Education (10%) - availability of private education, quality of private education provision, general public education indicators.

Infrastructure (20%) - transport (quality of road network, quality of public transport, quality of regional or international links), housing (availability of good quality housing), utilities (quality of energy provision, quality of water provision, quality of telecommunications infrastructure).

The Infrastructure category includes criteria such as the quality of the road network, public transport, regional/international links, housing, energy provision, water provision and telecommunications infrastructure. The Culture and Environment category includes a number of criteria which assess the provision of recreational and cultural opportunities.



5.3.2 Monocle - Liveability Survey

In assessing liveability, Monocle uses similar criteria to the Economist Intelligence Unit survey. Important criteria include safety/crime, international connectivity, climate/sunshine, quality of architecture, public transportation, tolerance, environmental issues and access to nature, urban design, business conditions, proactive policy developments and medical care.

The criteria that relate directly to local government include; public transport, provision for other forms of transport such as cycling, investment in cultural infrastructure, open space per person, environmental issues (waste management, air quality, cleanliness and litter, public transport using alternative fuels) and balance of preservation with forward thinking planning.

5.3.3 Mercer - Quality of Life Survey

The Mercer Quality of Life Survey uses 39 key quality of life determinants, grouped in the following categories:

- Political and Social Environment (political stability, crime, law enforcement etc).
- Economic Environment (banking services, regulation etc).
- Socio Cultural Environment (limitations on personal freedom etc).
- Health and Sanitation (sewerage, waste disposal, air pollution, infectious diseases).
- Schools and Education.
- Public Services and Transportation (electricity, water, public transportation, congestion etc).
- Recreation (restaurants, cinemas, sports and leisure etc).
- Consumer Goods (availability of goods/food daily consumption items, cars etc).
- Housing (availability etc).
- Natural Environment (Climate, natural disasters etc).

5.3.4 Value of the Assessment Criteria

At a municipal level the assessment criteria demonstrate the importance of the provision of high quality assets including roads, and public spaces, provision recreational opportunities and facilities, and the ongoing management of those assets in terms of how people view the 'liveability of our cities'. This is true at a local level, and based on the surveys, is also true at global level.

5.3.5 Comparison of 2011 Ratings

The following table provides a comparison of the ratings attributed by each survey in 2011 for the cities visited. Note that the surveys are generally only undertaken for capital cities. A number of the cities visited in the table below were not assessed and consequently, no rating is attributed. Although these cities are not assessed as part of the liveability and quality of life surveys, they provided valuable insights as to how

they were dealing with liveability and the asset management process. For instance the city of Tallinn (Estonia) provided valuable insights as to how they were dealing with issues such as the infrastructure backlog and population changes as a City/Country emerging from the former Soviet/Communist control. Other Cities such as Malmo, Sweden is home to a world-renowned urban renewal project, Västra Hamnen, which claims to be carbon neutral and is regarded as a ‘the city of the future’. Västra Hamnen is discussed further under Section 9 of this report as an example of a ‘liveable city’.

As outlined already, there is a high correlation between the ‘liveability’ and ‘quality of life’ criteria used in the above surveys. It is evident from the table that a number of the cities visited rate highly in each of the surveys. The attributes used for assessment in each of the surveys provide a valuable reference in terms of what makes a liveable city.


Table 5.3.5 Comparison of Ratings Attributed by Surveys for the Cities Visited

Cities Visited	2011 Rating		
	Monocle	Economist	Mercer
Melbourne (Australia)	5	1	
Helsinki (Finland)	1	7	
Tallinn (Estonia)			
Stockholm (Sweden)			
Staffanstorp(Sweden)			
Malmo (Sweden)			
Copenhagen (Denmark)	3		10
Rudersdal (Denmark)			
Munich (Germany)	4		4
Zurich (Switzerland)	2		2
Vienna (Austria)	6	2	1

In addition to the above, the table in Section 15.5 sets out in more detail some of the attributes of each of the cities, where the information is readily available including:

- European Green City Index Rating
- EIU Most Liveable City ranking 2011
- Monocle Most Liveable City ranking 2011
- Mercer Quality of Living survey 2011
- Population of the City Centre
- Population of the greater metropolitan area
- Green space area (m²) per person
- Carbon produced per head
- Percentage of domestic waste recycled
- Total percentage of citizens walking, cycling or taking public transport to work
- Water consumption litres/per person/day

From the table 15.5 it is evident that there is a high correlation between attributes such as the European Green City Index rating and the liveability ratings. The



attributes regarding; open space; and total percentage of citizens walking, cycling or taking public transport to work, are further referred to in Section 9.

The following section provides brief overview of the importance of liveability in terms of the sustainability and long-term economic success of a city and the role infrastructure plays.

6 Liveability, Amenity and Competitiveness

6.1 Amenity and Liveability

The report from the Victorian Competition and Efficiency Commission (VCEC) ‘A State of Liveability’ noted how the amenity of places, locations or regions contributes to the overall character and the enjoyment of residents or visitors — and so makes an important contribution to the sense of place and belonging in a community.

A number of factors contribute to the amenity of places. Physical features of an area contribute to its amenity and strong communities. These can include the physical landscape or streetscape and the built environment. Safety is a key consideration influencing the liveability of areas and places.

The planning and provision of infrastructure needs to ensure that public spaces and routes are attractive, representative of local characteristics, safe, provide for disabled and elderly people, are easy to get to and move through, and are responsive to change.

The Victorian Environmental Assessment Council (VEAC 2008) report 2008 ‘Metropolitan Melbourne Investigation’, recognises the provision of open space, parks including waterways and recreation areas and their contribution to improving liveability. Increased population density, increases the importance of maintenance, management and distribution of parks for liveability. The VCEC report also noted that the quality of the natural environment is a major contributor to Victoria’s liveability, and that challenges such as climate change will impact on the future liveability of the state.

Physical community infrastructure helps to make communities sustainable at a local level. In its broadest context, all infrastructure will have an impact on communities and the liveability of a place. Some infrastructure is tailored to more specific social needs (e.g. children’s services and child care centres, aged care centres, social housing, schools, libraries, multi-use community facilities, leisure centres, bike paths, pavements and parks) and will have a more direct impact on the assessment of liveability.



6.2 Competitiveness and Liveability

'Sustainability is a characteristic of a process or state that can be maintained indefinitely' (Source: 'Enhancing Victoria's Liveability', prepared for the Victorian Competition and Efficiency Commission, Urbis February 2008).

The term 'sustainability' is often used in reference to single fields. It is a commonly used term in the environmental field, and it could equally be applied to infrastructure in an asset management context. From an asset planning perspective the term sustainability refers to balancing the ecological impact of cities with the quality of life of its inhabitants, or more traditionally achieving a balance between environmental, social and economic considerations (i.e. triple bottom line).

Urban environments are known to have both physical and social characteristics which facilitate or impede the satisfaction of human needs and thus influence wellbeing. For example urban design aspects of urban form such as density and street design have been linked with a propensity to walk and this consequently affects health status.

From an asset management perspective, the narrow view of sustainability would see the imperatives being more about maintaining the current asset base (i.e. assets are maintained in a safe and serviceable condition). Whereas the challenge is to understand the drivers that make an environment liveable for different people and apply those considerations in the asset management process.

6.3 Urban Design and Competitiveness

The level of productivity sets the sustainable levels of income that can be earned by an economy (Source: 'Enhancing Victoria's Liveability', prepared for the Victorian Competition and Efficiency Commission, Urbis February 2008). More productive economies provide a higher level of income for their residents. From an urban design perspective infrastructure contributes to competitiveness for example, good infrastructure is important in the reducing the time taken for the efficient distribution of goods and services, and also for the efficient distribution of energy etc. Urban design is only one of a complex set of variables which contribute to liveability.

There are many other factors including physical attributes such as climate, political stability, government policies which influence the liveability of a city. The VCEC report notes that the liveability of city contributes to its competitiveness as this draws the best human talent. The urban form can and does influence the extent to which residents can satisfy their needs and enjoy high levels of wellbeing. Cities where liveability and wellbeing are the primary goals of the community and where the urban environment is developed to support community needs are generally more competitive from an economic perspective.



6.4 Liveability as an Output Measure

The liveability rating attributed by the various studies provides an output measure at an international level, and as such, provides an authoritative benchmark for what residents, and visitors regard as being important.

'Liveability' is used to describe the overall contribution of the urban environment in influencing the quality of life or health and wellbeing of residents. As outlined above cities where liveability and wellbeing are the primary goals of the community and where the urban environment is developed to support community needs, are generally more competitive from an economic perspective.

7 Liveability and Infrastructure


At a municipal level it is necessary to understand the contribution that assets and facilities make to the liveability of a place.

The following sections 7.1.1 and 7.1.2 examine elements outlined in two Victorian State Government reports as contributing to liveability. Section 7.1.3 draws together the elements of these reports with the assessment criteria used in the international surveys to provide a comprehensive summary of infrastructure at a municipal level that affects liveability.

7.1.1 A State of Liveability: An Inquiry into Enhancing Victoria's Liveability, The Victorian Competition and Efficiency Commission

The Victorian Competition and Efficiency Commission, in its report, identified a list of common elements of a liveable place for most Victorians:

- Community strength
- Economic strength
- Built infrastructure
- Social infrastructure
- Amenity and place
- Environment and sustainability
- Citizenship
- Services
- Equity and human rights
- Participation
- Leadership and good governance
- Information
- Transport
- Innovation



The elements identified in the above study align with the assessment criteria in the previously mentioned surveys, and provide a further insight into the elements to be considered in a Victorian context.


7.1.2 Ministerial Advisory Council for the Living Melbourne, Living Victoria Plan for Water (Living Melbourne Living Victoria Roadmap)

Other factors such as the provision of services play an integral role in the liveability of cities and towns. For example a recent report, the Ministerial Advisory Council for the Living Melbourne, Living Victoria Plan for Water (Living Melbourne Living Victoria Roadmap) identified 'integrated water cycle management' (e.g. the use of stormwater, rainwater, and recycled water), as a key considerations for the future design and development of Melbourne. Population growth, climate risk and variability all impact on the security of good quality, affordable water supply for the city.

7.1.3 Liveability; and the Planning, Provision and Maintenance of Assets at a Municipal Level.

In summary, from an asset management perspective at a municipal level, the key infrastructure elements that effect liveability are described as follows;

- **Built infrastructure** (such as hospitals, libraries, housing, energy, water and drainage, telecommunications, freight and public transport networks, education, and sport and leisure facilities) that is adequately provided and maintained.
- **Amenity and place** — urban planning that meets local needs balanced with broader community needs, including safety, convenience, aesthetics and services, including open spaces and recreational areas such as parks, beaches, bays, rivers and lakes.
- **Environment and sustainability** — sustainable use of resources (including land, water, biodiversity) to ensure a highly liveable environment for current and future generations and meeting the needs of the present without compromising the ability of future generations to meet their needs.
- **Transport** — mobility of population and efficient distribution of goods across Victoria facilitated by flexible transport choices that are efficient and environmentally sustainable.
- **Innovation** — continuous improvement in physical and environmental practices, including through the adoption of new technology.



There is a high degree of correlation between the elements identified for assessment of liveability in the above surveys and in both the Living Victoria Plan for Water and VCEC reports. There is a question as to how these criteria can be used to inform the planning, provision and maintenance of assets at a municipal level.

8 Integrated Infrastructure Planning

8.1 Background

Each of the liveable cities visited had attributes which were aligned with the concept of liveable cities. The cities were generally of a moderate size up to 1.3 - 1.4 million people, prosperous with an extensive network of public transport; access to open space; urban and public space; access to educational, cultural and recreational events and activities. Each of the cities are facing the pressures of rapid population growth. In some cases, as with Germany, even with declining national population, Munich was continuing to grow, with low levels of unemployment.

Information provided at each of the municipal visits is summarised in Attachment 15.3 (Section 15). There are a number of lessons that can be learned from the experience of those municipalities. It is worth briefly examining some of these experiences in the context of the current direction adopted for metropolitan Melbourne.

8.2 Asset Management

As outlined already, at a municipal level, Asset Managers tend to concentrate on the planning, delivery, management and maintenance of infrastructure assets that are responsive to local needs including; roads, drains, streetscapes, urban spaces, trees, and recreational facilities. The quality of these assets has a large bearing at a regional, national and international level in terms of the perception of what is a desirable place to live. The assessment process often loses sight of the overall contribution that these assets and facilities make to the amenity, wellbeing, safety and accessibility of the urban environment.

8.2.1 Key Components of Lifecycle Asset Management

Asset management involves optimising physical planning, provision/state of an asset with factors such as levels of service, growth forecasts, risk management and resource capacity. This is then used to predict future capital requirements to meet the above, which feed into the Strategic Resource Plan.

The International Infrastructure Management Manual (2006) lists the key components of lifecycle asset management are summarised as follows:

- **Asset Planning**
 - Proposed asset is the most effective solution **to meet the customers need**
 - Bring to account all costs associated with the provision and maintenance of the asset
- **Asset Creation/Acquisition**
 - Asset purchased, constructed or otherwise created
- **Operation and Maintenance**
 - Ensure asset condition and physical state and performance **meets service level targets**
 - Long-term financial planning/capital provisioning to ensure assets meet their performance and service level targets
- **Asset Disposal/Rationalisation**
 - Plan options when assets no longer meets the service needs or becomes uneconomical to maintain/rehabilitate.

The lifecycle asset management process can be represented by the following simple model.



Service level targets need to be addressed at each stage in the asset management process. Traditionally Asset Managers are experienced in the fundamental technical process which are well defined (e.g. condition auditing, physical lifecycle planning, modelling capital requirements etc). However the process for establishing and agreeing levels of service with communities which is fundamental to each of the steps of asset management is not well defined.



8.3 Council as Custodian of Community Assets

Local Government in Australia has approximately \$212b in assets and infrastructure under management (Source: Municipal Association of Victoria - MAV). At a State level, Victorian Local Governments manage \$55b worth of community infrastructure and assets (Source: MAV) including; buildings, roads, drains, bridges, footpaths, playgrounds, sports fields, parks and reserves, street furniture etc. Councils have an obligation to ensure that sufficient funds are provided in their Strategic Resource Plans to ensure that these facilities are maintained in a safe and serviceable condition in the long-term to meet defined service standards.

Councils also have an obligation to ensure that they manage all assets on a life cycle basis with full knowledge of the social, environmental and financial costs, benefits and risks associated with that asset. Asset Management is concerned with managing each phase of an asset's life from inception through to disposal.

There are a number of activities involved with the management of assets through their lifecycle namely:

- **Operations** – activities which have no impact on the condition of the asset, but that are necessary to keep the asset functioning.
- **Maintenance** – reactive and planned maintenance required to maintain the asset at its current level. Such activities would include painting, roof repairs, graffiti removal etc.
- **Renewal** – rehabilitation or replacement of an asset to meet contemporary functional needs and/or to restore the asset to its original capacity/condition. Renewal activities could involve reconstruction of a road, road resurfacing, kitchen replacement, reroofing a building etc.
- **Upgrades/New Works** – include augmentation of an asset to meet growth or to meet increased service standards e.g. which increases the service standard of the asset beyond its original capacity/condition, such activities could include road widening, installation of a new commercial kitchen.
- **Disposal** – sale, removal or decommissioning of an existing asset.

Where adequate funds are not provided for Maintenance/Renewal activities, assets will deteriorate over time. As the assets deteriorate they will reach a point where they are no longer safe/serviceable (not fit for purpose), and may either require a large capital injection for rehabilitation, or in the worst case if funds are unavailable, the asset may need to be decommissioned. Asset management is a structured approach to the sustainable management of assets through their whole life cycle.

8.3.1 Asset Management Process

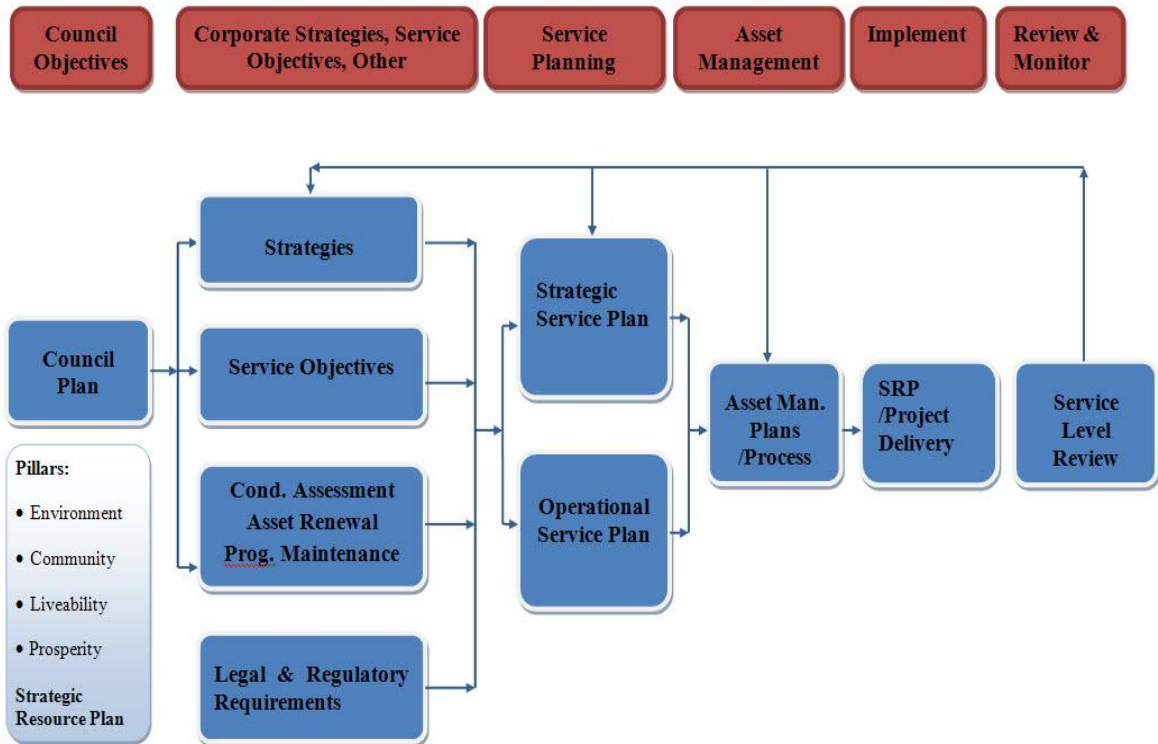
As discussed above the Liveability assessment provides an authoritative outcome measure, based on an international rating scale. Also discussed above is the importance of liveability for the future sustainability of cities, and the elements of infrastructure managed at a municipal level that contribute to liveability.

The following diagram illustrates the relationship between the Council Plan at a municipal level, and the delivery of infrastructure projects (including maintenance). In essence the strategy framework translates the objectives of the Council Plan into tangible deliverables. The process is highly simplified in the diagram on the next page in order to illustrate conceptually the process.

From an asset management perspective, corporate strategies and corporate service objectives, combined with other inputs such as asset renewal requirements, programmed maintenance requirements, and regulatory requirements, inform the service planning at both an operational and strategic level. Those in turn become inputs to the preparation of asset management plans.

The following section examines the approach adopted by many overseas cities to integrated urban planning, and examines some of the key elements which affect the planning, delivery and maintenance of municipal infrastructure.

ASSET MANAGEMENT PLAN – INPUTS/OUTPUTS/OUTCOMES





9 Integrated Planning (Asset Planning and Creation)

The success of many of the cities visited is based on the integration of land use planning, urban design, infrastructure planning, and delivery/implementation. Many of the municipalities had regional planning control, were able to set planning policy direction and were also responsible as the planning authority. The municipalities also controlled provision and delivery of many other services including hospitals and health, education, public transport etc.

Each of the municipalities, particularly those that ranked amongst the world's most liveable cities had very strong urban planning frameworks. Within these frameworks the urban design policies/strategies of particular interest from a municipal asset management perspective address urban and public open space, transport/mobility, and environmental sustainability. Given the local government structure, municipalities were generally able to coordinate and integrate land use planning with the planning, delivery and maintenance of municipal infrastructure. Given this it is valuable to make relevant comparisons with Melbourne.

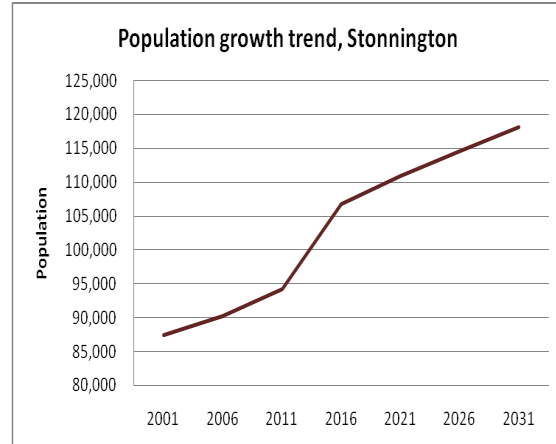
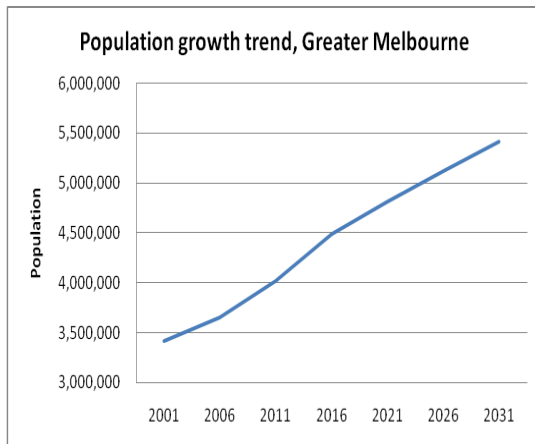
9.1 *Population Increase*

Many of the European Cities visited were experiencing significant population increases. In cases such as Germany, while the national population may have been decreasing, the population of the major cities such as Munich itself was increasing.

The ongoing population shift and consequent densification presents significant problems for those cities in terms of urban planning, with flow-on implications for transportation, infrastructure, energy supply and efficiency, access to low cost housing, social stratification, access to high quality urban spaces etc.

Despite increasing population the cities visited generally reported relatively low rates of unemployment (lower than 8 per cent). It is interesting to note that low levels of unemployment combined with favourable liveability characteristics continue to further promote migration and population growth which further exacerbates the challenges with ongoing densification.

These same issues are being experienced locally with escalating growth rates. Ongoing densification has significant implications for the liveability of Melbourne and the metropolitan area. The following section examines some of the impacts of projected population increases for the Melbourne metropolitan area and also as an example the impacts on the City of Stonnington (where the author is employed) an inner metropolitan Council. The following graphs show a projected population increase for the Melbourne area of nearly 60 per cent, and for Stonnington of nearly 35 per cent over the 30 years to 2031.




9.2 Integrating State-Wide and Local Planning

A challenge for Melbourne is the coordination of urban development between state and local levels of government, and integration with other agencies such as utility companies, public transport operators etc. A great deal of the success of the cities visited was based on the integration of strategic decisions, in that the municipalities concerned were able to undertake urban renewal projects on a larger scale as they also controlled many of the utility companies and other services such as health, education, law enforcement, public transport as well as the provision and maintenance of infrastructure. There is a significant challenge in Victoria with the division of these responsibilities between Federal, State and Local Governments.

A number of the cities were undertaking large scale urban renewal/redevelopment projects, these are referred to in more detail in Section 15 (Attachment 15.3). Prime examples include; Västra Hamnen (Malmo – Sweden), Royal Seaport Project (Stockholm – Sweden) and the Jarkasaari Precinct Town Plan (Helsinki – Finland). Typically, each of these projects involves the creation of thousands of residential apartments, in combination with retail and commercial precincts, including networks of urban spaces, open space, public transport, energy efficiency and water cycle management provisions. The developments adopt compact city principles and are sustainable in terms of the provision of local economic activity and employment, and incorporate social, environmental, economic and urban design features. *Vastra Hamnen* (Malmo Sweden), and *Norra Djurgardsstaden Stockholm Royal Seaport Hjorthagen* (Sweden) are examined in more detail at the end of this chapter and provide illustrative examples of integrated planning and integrated infrastructure provision achieving liveability principles.

Similar examples in Melbourne include the Dockland project which is located 2km west of the Melbourne Central Business District. This urban renewal development project adopts many of the liveable city principles and will have a residential population of 20,000, when completed in 2015.




In terms of Victoria, the report prepared by the State Services Authority titled: 'Victorian approaches to joined-up government an overview' recognises the difficulties with integrating state-wide planning processes with regional and local processes. It goes on to acknowledge the tension between central planning and decision making, and innovation and flexibility at a local level. The paper further recognises that this area is complex with inherent tensions, and that these tensions are likely to increase with locally-determined priorities competing with state-wide program priorities.

The resulting approach to land use planning makes it more difficult to achieve the principles of liveability such as the 'Compact City' approach which would see the development of a Metropolitan Core and Municipal Town Centres. Current land use planning for Melbourne continues to support further urban sprawl, whereas it is well known that continued population growth and expansion of the urban areas are threats to the sustainability and liveability of the city, and the wellbeing of its residents. Further, such urban expansion without concentrating factors such as housing mix, service provision, employment in urban centres can lead to a poor outcomes (e.g. social stratification, extended commuting times, difficulties for providing transportation infrastructure, lack of access to work and other services with consequent traffic increases etc).

These concerns are borne out in ongoing public debate and again reinforced by comments reported in *The Sunday Age* (8 July 2012) from Professor Michael Buxton (Royal Melbourne Institute of Technology) in an article titled 'Housing glut hits suburbs', which stated that: "We are designing the world's worst suburbs, the housing stock is terrible and they have very poor liveability. We are going down the same path as the US, where areas outside major cities have become suburban ghettos'. This was further reinforced in the same article with comments from the former president of the Planning Institute of Australia, Marcus Spiller who stated that: "We will end up with two Melbourne's, one that is prosperous and well served with infrastructure and employment opportunities, versus a second one on the fringes, which is dislocated with property prices that are far less buoyant." He went on to say that: "The Government had no 'credible strategy' to stimulate employment growth or provide public transport and schools in outer suburbs."

As outlined, there are recognised challenges with the existing urban planning system, and the current approach to urban planning of increasing densification for inner metropolitan Melbourne without sufficient provision for infrastructure, transport, urban and public open space. This, combined with the ongoing expansion of the metropolitan area, poses threats for the future liveability of metropolitan Melbourne.

It should be noted that the Victorian Government is preparing a new metropolitan planning strategy for Melbourne to build on its liveability and ensure the future prosperity of the State. The strategy will contribute to the overall vision for the State including links with regional Victoria. It will shape how the city changes, which areas take more people and which planning rules should change to facilitate new and more diverse housing.



The aim of the metropolitan planning strategy is to build on Melbourne's strengths and character, guide decisions about development including infrastructure and investment, ensure that communities including businesses and councils in Melbourne and regional Victoria can make informed decisions about their future, and to provide tools and systems to make it easier to make responsible planning decisions.

This Strategy aims to protect the valued aspects of Melbourne while allowing for future needs including housing choice, transport accessibility, economic growth, environmental protection, infrastructure and services to support growth and change.

9.3 Open Space Provision


Each of the cities visited placed a great deal of emphasis on the provision, quality, and accessibility of open spaces including urban public spaces. Cities such as Vienna for example pride themselves on the fact that 50 per cent of the municipality is open space. The provision and accessibility of open space provides for quality of life, passive and active recreation and urban spaces for congregation and other activities such as cultural events, and are a key criterion in the assessment of liveability.

The green current space/open space provision for Melbourne City is 46 m² per which compares favourably at an international level with other cities. (Refer to Attachment 15.5, Section 15).

In Victoria, the Planning and Environment Act (1987) does not specifically provide for requirement of open space as part of the development application process. However where the development involves subdivision there are provisions under the Subdivision Act (1988) to require up to five per cent of the land, or of the land value, as an open space contribution. This condition is often applied as a requirement on the subdivision following the development of the land.

The requirement for a five per cent open space contribution is reasonable for broad acre subdivision, where the density of subdivision is relatively low. In broad acre development the contribution of five per cent may yield a parcel of land that can be meaningfully developed to provide for the recreational needs of the subdivision. However in the metropolitan area the trend is for smaller parcels of land, often 2000m² or less are being redeveloped from a low density condition to high density multi-storey apartments. If the development is not subdivided there is currently no opportunity to recover any contribution to open space. As the allotments are generally relatively small, a contribution of five per cent of the site for open space is impractical, generally the contribution is taken as cash. This is aggregated and used to acquire further open space or to improve existing open space. However the five per cent contribution is applied to the land value and is not cognisant of the density of the development.

As a consequence, with further densification of population, the open space provision per head particularly for existing metropolitan municipalities is continually being



eroded. The implications are that liveability and amenity are also continually being degraded. It would be more appropriate for the open space contribution to be linked to the development outcome (residential and commercial), and to be mandated under the Planning and Environment Act, rather than through the Subdivisions Act.

Based on the municipal visits it was evident that cities such as Munich and Copenhagen recognise the contribution and importance of open space from a social perspective and apply much more stringent requirements for the provision of open space as part of development works. Copenhagen requires up to 40 per cent open space for new developments while Munich requires 14m² per person, which will ensure that as those cities undergo further densification, their liveability (from an open space perspective) is maintained. Each of the 'liveable' cities visited had a relatively high ratio of open space m²/head, with open space well distributed, so that residents had easy access. There are already deficits in terms of the distribution of open space in the Melbourne metropolitan area, this is exacerbated as densification occurs and both the distribution and average m² per head of population will decline under the current open space provisions.

There are no universal benchmarks for Public Open Space in relation to population or location because of the variety of roles, functions and demands placed on Public Open Space. By way of example, Canberra has a provision ratio of 40m² per person and New South Wales has adopted 28.3 m² per person as its benchmark.

In the context of Victoria, The Planning for Community Infrastructure in Growth Areas Report produced in 2008, in conjunction with all Growth Area Councils, details a framework of infrastructure provision across new urban areas, with the aim to: 'encourage a consistent approach by the Growth Councils to the planning of community infrastructure in their development areas'.

This document includes provision rates for active and passive open space which are expressed as:

- Neighbourhood Passive Open Space: 1 ha per 1000 people or 10 m² per person
- Neighbourhood Active Open Space: 8 ha 9000 people or 8.88 m² per person
- Higher Order Active Open Space Reserve: 30 ha per 40000 people or 7.50 m² per person

This would result in a total provision of 2.64 ha per 1,000 head of population or 26.4 m² per person. Ideally, open space would be widely distributed and easily accessible.

From the Stonnington perspective (where the author is employed), the Metropolitan Melbourne Investigation Discussion Paper (VEAC Oct 2010) notes that Stonnington has the second lowest amount of public open space as a proportion of the land area of any Victorian Municipality at 6.7 per cent (Glen Eira has the lowest at 4.7 per cent) while the average across Metropolitan Melbourne is 17.9 per cent (46 m² per person - refer to Table 15.5, Section 15).

Based on the projected population increase in the graph shown previously, the ratio of open space per person, will decrease from 19m² per person in 2001 to 14m² per person by 2031. This is well below the standards outlined above, and continues to degrade the liveability of the municipality.

Based on discussions with colleagues in other municipalities it is evident that this is a consistent trend across metropolitan Melbourne. The current open space provision of five per cent does not compensate for the loss of open space amenity and liveability associated with ongoing densification of the existing metropolitan, as outlined, it would be more appropriate for the open space contribution to be linked to the development outcome (residential and commercial).

9.4 Mobility/Transport Management


Traffic and transport are key issues from a liveability perspective. All of the cities visited had high level frameworks/strategies for managing mobility which included road-based transport, public transport, parking, walking and cycling. (Refer to Attachment 15.3, Section 15.) These mobility strategies typically formed a key component of the urban planning frameworks, and featured as a key consideration in any urban development and urban renewal/redevelopment project.

As examples, the City of Vienna incorporates a Transport Masterplan as a key component in its urban planning framework and the City of Copenhagen has a 'Green Mobility Strategy' which is an integral part of the land use planning framework. These strategies also provide strategic direction for infrastructure planning and provision, urban design and community education regarding transportation/mobility. A useful measure of the success of these strategies is the percentage of daily commutes that are made by walking, cycling, or taking public transport to work.



Referring to the table in the attachment 15.5 (Section 15), non-car based daily commutes to work are typically in the range of 60-90 per cent for the most liveable cities, that is 60-90 per cent of daily commuter trips are made by cycling, walking or via public transport.

Each of the liveable cities visited have taken steps to exclude traffic from their commercial centres, and encourage pedestrian and cycling activities. Typically the cities had extensive system of malls which catered for both pedestrians and cyclists. The cities had variously dealt with the traffic issues by implementing infrastructure



solutions to cater for through-traffic including large scale infrastructure solutions. As an example, Helsinki had an extensive system of underground tunnels providing road access, car parking and delivery access to major commercial facilities, effectively reducing congestion on the road network and eliminating commercial vehicles from the city centre.

Other infrastructure solutions also included ring roads in Stockholm, Munich and Copenhagen to divert traffic from the city centres. The Norrelankan, North Link project in Stockholm is a large scale diversion of the E20 European Highway, through tunnels which will take an estimated 25,000 vehicles per day underground and create a safer cleaner environment for pedestrians and cyclists.

The redundant road reserves were subsequently transformed onto areas for redevelopment and for events, cultural events, alfresco dining, community markets and other socially attractive activities. The Victorian Transport Plan 2010 has been abandoned by the current State Government. Although, it is acknowledged that there is an ongoing program of network improvements proposed through the Department of Transport for the both the road-based and public transport linkages, for example the proposed east-west road tunnel, and rail linkages between the north and south. The introduction of other measures such as a congestion taxes are still the subject of ongoing public debate. The Transport Integration Act 2010 requires the preparation of an integrated transport plan which addresses objectives such as: social and economic inclusion, economic prosperity, environmental sustainability, integration of transport and land use, efficiency, coordination and reliability, safety and health and wellbeing. It should also be noted that the newly formed Department Public Transport Victoria (April 2012) will provide a coordinated and integrated approach to public transport solutions for Melbourne, and ultimately reduce the demand for road-based transport particularly in the metropolitan area.

As outlined, in a quest to provide more affordable housing current land use planning for Melbourne continues to support further urban sprawl. Such urban expansion without concentrating factors such as housing mix, service provision, employment in urban centres can lead to a poor outcomes such as extended commuting times, difficulties for providing transportation infrastructure, lack of access to work and other services such as educational facilities and consequent traffic increases, etc.

At a municipal level, the management of mobility including traffic and parking with regard to urban development pressures is a key issue to be addressed in terms of local liveability. It is clear from the study tour experience that at a municipal level a mobility strategy should form a key component of the municipal urban planning strategy framework.



9.5 Sustainability and Environment

There is also a high correlation between those cities listed in the top 10 in each of the liveability surveys and those cities that rank highly in the European Green City Index (EGCI), a research project conducted by the Economist Intelligence Unit. (Refer to Attachment 15.5, Section 15.)

Each of the cities visited were actively pursuing programs for the reduction of energy consumption in both public and private facilities. Programs were in place for systems such as district heating which distributed heat from municipal waste incineration to large areas of the metropolitan area. There were also investigations underway to examine the opportunity to reticulate cooling through the same system.


A number of cities were investing in alternative sources of energy such as biogas, wind and solar in order to diversify their energy sources and to secure future energy supply. Many of the cities have set ambitious carbon reduction targets, partially in response to European Union (EU) carbon reduction target of 20 per cent. The approaches of cities visited are briefly outlined in Attachment 15.3 (Section 15). Cities not in the EU are also actively pursuing carbon reduction targets.

Referring to the table in Attachment 15.5, Copenhagen was scored as number 1 on the EGC Index. Copenhagen has a target of becoming the first carbon neutral region by 2030. They actively promote Copenhagen as a location to study and test state-of-the-art solutions for renewable energy, sustainable urban planning, and sustainable transport.

Stockholm features as number two on the EGC Index and was named Europe's first Green Capital for 2010 in competition with 35 other European cities. Stockholm has actively been pursuing environmental and climate goals for many decades. Stockholm has very low carbon emissions of four tonnes of greenhouse gases per resident, has long-term goal to be fossil fuel-free by 2050, and has established the ambitious target of reducing greenhouse gas emissions to three tonnes per resident by 2015.

As another example, Zurich has set an ambitious carbon reduction target as a result of a community referendum, where 76.4 per cent of respondents agreed to set a carbon reduction target to reduce carbon footprint from around 5tCO₂ per person to 1tCO₂ per person by 2050. Their reduction programs focus on energy source (water, wind, solar, hydro); Efficiency Technologies (building insulation, electric mobility, and lighting); and Sufficiency (mode of transport, living space etc.)

Zurich is in a unique position where they have secured alternative energy supplies and own a Hydro station 150km away, and wind generation plants in Germany, Norway and Switzerland. In 2010 around 65 per cent of their energy needs will be met by hydro/other renewable/waste incineration. The balance is supplied by nuclear



energy. However the national target is to be nuclear free by 2044. So the city will need to secure other energy sources to make up the deficit.

At this stage the imperatives to secure cost effective alternative energy sources in Australia are not as great given the availability of relatively cheap, secure energy sources such as coal and natural gas and the lack of Federal and State Government leadership in this area. The recently introduced Federal carbon tax initiative is the first formal tentative step by Australia in this direction.

9.6 Changing Community Attitudes

A number of the cities visited commented on changing resident attitudes and expectations of public spaces. This is particularly critical with ongoing densification, and with the reduction in the open space availability per head as discussed.

The City of Zurich particularly identified that over the last 15 years there has been a shift in emphasis to a more social focus for infrastructure upgrade projects, hence they have placed a greater emphasis on urban design, and creating social value adding outcomes. 'Essentially residents want more from open space, particularly with increasing densification of the City'. All of the cities place a great deal of importance on the quality of the urban design and social outcomes, they are cognisant of the role that the quality of their urban public spaces plays in the liveability of the city for residents and visitors alike.

The City of Zurich in responding to the changing shift in emphasis, applies an urban design overlay to all infrastructure renewal/upgrade projects. They put a great deal of emphasis on the coordination of all authorities works, and drive a high quality urban design outcome, which ensures that the urban spaces created are high quality and sensitive to community needs and social values. This approach is also evident in all of the other cities visited.

9.7 Examples of Integrated Planning and Infrastructure Provision

The following examples are provided as an example of what is being achieved in large scale urban renewal projects across Europe. Both projects provide a truly integrated approach to urban development. These developments incorporate liveability principles including socio-cultural, economic, technical, and environmental qualities. These examples demonstrate what can be achieved through an integrated planning and development process. There is a question as to how these outcomes can be achieved and to what extent they can be achieved in the planning, development, and maintenance of infrastructure at a municipal level.

9.7.1 Västra Hamnen (Malmö Sweden)

The district is recognised as one of the most sustainable districts in Europe. The 175 hectare artificial island of Västra Hamnen was bought by the Municipality of Malmö in 1996 to develop a new eco-district. The area has been developed with an emphasis on aesthetics, ecology, high-quality housing, architectural diversity and urban spaces. It achieves environmental adaptation and social sustainability in a densely built-up area.



Some key features of the development include:

- Rainwater is collected, grey water is treated, a system of ponds and open channels exist and there are moss covered roofs.
- Open rain water management and creation of habitats provides for a high level of biodiversity.
- Use of a green space increases rain water infiltration.
- Wind turbines provide 100 per cent of the electricity.
- Solar panels on the roof provide 20 per cent of the heating with the balance coming from an existing, super-efficient district heating system.
- Recyclable and organic materials are collected to contribute to energy production by the city's biogas plant. The biogas is then used to heat homes and power vehicles.
- The residents are able to monitor their energy consumption on information panels in each home.
- Paths and cycle tracks are a feature of the district.
- The focus has been on the use of resources, human interactions and the aesthetic appeal of the development.
- Private investors developed the district in small packages and were guided in providing quality solutions for the district.



9.7.2 Norra Djurgårdsstaden Stockholm Royal Seaport Hjorthagen

The development is sited in areas previously used for gas production and other industry. The ports operations will be modernised and concentrated on piers, while the container and oil handling will be moved elsewhere. The development will include 10,000 new homes and 30,000 new jobs.

A ten minute bike ride from the Central Station the district will offer a wide variety of jobs. The area is being developed by a number of developers and architects, to ensure variation and an even distribution of rented and tenant occupied houses, interspersed with housing for the elderly and students.

The project includes the reuse of a number of existing industrial buildings. The former gas works will be home to a cultural cluster, public buildings such as pre-schools, library, museum, shops and homes.



The objectives of the project include developing an environmentally sustainable city district with a genuine city environment with emphasis on technological innovation, building work using energy efficient materials, as well as minimising energy consumption.

A related project is the E20 European Highway, the North Link, Norralanken. The north link is a 5km ring road that will mainly be built in tunnels. The motorway will link to the sea port and take half of the existing 50,000 vehicles per day which use the road network which will create a safer and cleaner environment for pedestrians and cyclists.



Objectives of the Stockholm Royal Seaport Project

This project is not dissimilar to Melbourne's Docklands development and the objectives provide a useful reference, and define the core objectives for all of the urban renewal/redevelopment projects visited:

- **Social**
 - Good access to public and commercial services
 - A safe living environment for children and adults
 - Successful integration of old and new
 - Proximity to park and green spaces and good recreational opportunities

- 
- **Environmental**
 - Reduce climate impact
 - Tackle polluted areas
 - A healthy living environment
 - Safeguard and develop biodiversity
 - **Economic**
 - Effective land reuse
 - Make the most of the central location (access to existing services)
 - Encourage good entrepreneurial climate
 - **Physical Space**
 - Accessible, vibrant and varied urban development
 - Protect and safeguard the historic built environment
 - Safeguard the valuable cityscape and landscape
 - Excellent public transport provision and pedestrian and cycle paths

Principles

The principles used in the design and developments of the projects are briefly summarised as follows:

- **Transport**
 - Prioritises links for cycle paths and pedestrian paths.
 - Limited parking - Stockholm Royal Seaport allows 0.5 car spaces per household, with underground car parking.
 - A low number of car parking spaces is required for offices and retail premises.
 - Prioritises walking and cycling, then public transport and car sharing schemes.
 - Bicycle hire.
 - Parking facilities for a number of bicycles for each apartment.
 - Sites for car share schemes and car pooling systems.
 - Public art - Stockholm 1 per cent of total spend is dedicated to public art.
 - Congregation spaces, meeting spaces, large communal spaces for cultural activities (e.g. markets, and events) squares, walks.
- **Environment**
 - Creation of green corridors, for habitat and localised planting to improve the micro climate.
 - Provision of easy access to parks and green spaces for relaxation, recreation and sport.
 - Developers are required to provide a high level of green cover in inner courtyards, and rainwater management systems.



- Stormwater managed Water Sensitive Urban Design to provide for watering local planting, trees and vegetation, and other green spaces, as well as urban wetlands.
 - Linkages to commercial areas, shops, schools, cultural facilities (libraries, sports facilities) and medical facilities.
 - Integrated basic facilities, supermarkets.
 - Traffic and parking relocated underground, to free up surface for pedestrians and cyclists.
 - Retention and reuse of existing buildings where possible.
 - Public transport network access, including provision of light rail, trams, buses and access to the main train network.
- **Energy**
 - Buildings to be energy efficient.
 - Energy to be renewable, buildings to be designed to include their own solar/wind energy generation.
 - **Waste**
 - Nutrients to be stripped from stormwater and sewerage.
 - Food receptacles provided in buildings to keep food waste for biogas production.
 - Developments to include provision for recycling.
 - **Information**
 - Information made available on consumption, costs and usage (e.g. daily use of hot water and electricity).

9.8 Asset Management, Maintenance and Renewal

Increased population density, increases the importance of maintenance of infrastructure. Clearly increased usage rates increases wear, and consequently higher maintenance effort is required to ensure that assets remain in a safe and serviceable condition. This is clearly evident particularly in inner city areas with the use of facilities such as recreational ovals/pitches, where excessive demand and usage can render these facilities unusable. This sort of overtaxing of infrastructure leads to the need for investment in other technologies/solutions such as artificial turf.

Meeting the demand resulting from ongoing densification was a theme for a number of papers presented at the IFME Conference. A number of presenters and a number of the cities visited identified a key challenge as being to achieve a balance between renewal, reuse, and/or demolition and replacement of assets with the objective ensure cost efficient and environmentally sustainable solutions.



10 National Approach to Asset Management

The Victorian State Government is moving towards adopting the National Framework for Asset Planning and Management for Victorian Local Government.

The National Framework is essentially an extension of the Victorian MAV (Municipal Association of Victoria) 'Step Asset Management Program' and includes nine elements:

- Asset management policy
- Asset management improvement strategy
- Governance and management arrangements
- Asset Management Plans
- Annual and long-term financial planning
- Organisational capacity
- Operational and asset management processes – data and systems
- Community engagement
- Levels of service

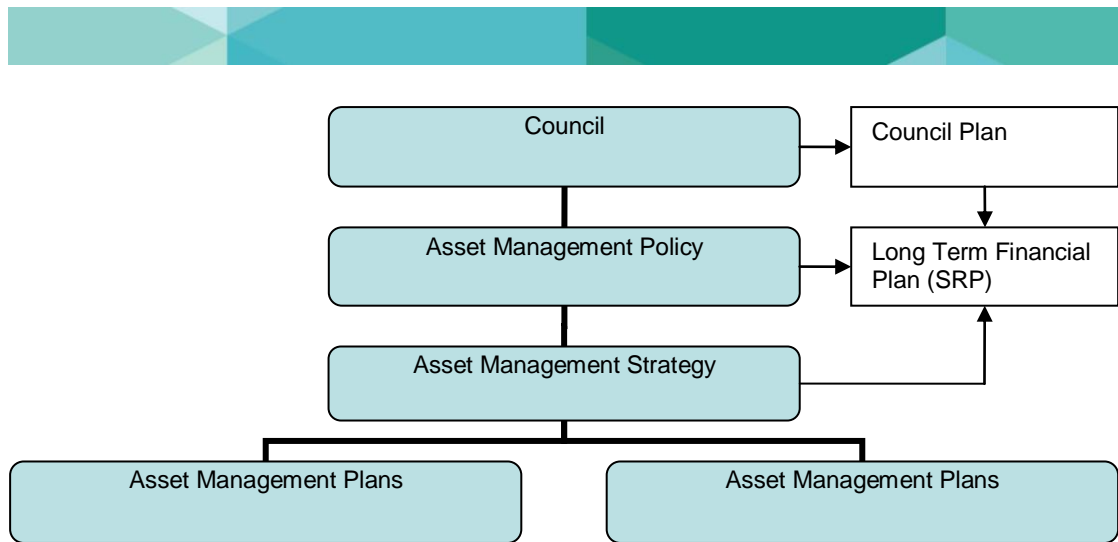
The national approach promotes prudent, transparent and accountable management of local government assets. It promotes a strategic approach to meet current and emerging community needs.

10.1 Asset Management Framework

Under the National Framework, Council is required to have an adopted Asset Management Policy, Asset Management Strategy and Asset Management Plans to inform the long-term capital requirements of the organisation. The role of each of these components is briefly summarised below. (Reference: IIMM.)

The long-term capital requirements are used to inform the preparation of Council's Strategic Resource Plan, in terms of the long-term capital requirements for the sustainable management of Council's assets.

The relationship between the suite of asset management documentation and the long-term financial provisioning for the organisation is represented diagrammatically on the next page.



10.2 Asset Management Policy

An asset management policy/statement sets out Council’s policy framework for asset management which:

- Establishes the objectives for asset management providing a platform for service delivery.
- Integrates asset management with corporate and financial planning.
- Assigns accountability and responsibility for service delivery together with asset management.
- Broadly takes account of whole of life costing, service levels and financing options..
- Requires the adoption of an asset management plan informed by community consultation and local government financial reporting, and which is supported by training in financial and asset management.

10.3 Asset Management Strategy

The asset management strategy supports the implementation of the asset management policy. The asset management strategy demonstrates how the asset portfolio will meet the service delivery needs of the community into the future, enables Council’s asset management policies to be achieved and ensures the integration of Council’s asset management with long-term strategic plans.

The Asset Management Strategy addresses the following:

- What assets we currently have.
- How those assets are managed including current and forecast future needs, and adequacy of funding.
- Where we want to be? The asset management strategy is linked with the goals and objectives of the Council Plan.
- How will we get there? Including Strategies for the sustainable management of Councils assets into the future.



10.4 Asset Management Plans

Asset management plans:

- Include all assets on an asset register.
- Provide information about assets, including particular actions required to provide a defined level of service in the most cost-effective manner.
- Incorporate risk management strategies.
- Include financial information such as capital expenditure for renewing, upgrading and extending assets.
- Include consideration of non-asset service delivery solutions (leasing, private/public partnerships).
- Recognise changes in service potential of assets.
- Be subject to a performance review.
- Outline an improvement program.
- Demonstrate clear linkages to other Council strategic documents.

10.5 Levels of Service – NAMA Key Assessment Criteria

To achieve the advanced NAMF level, a number of requirements need to be addressed. (Refer to Attachments 15.6 and 15.7, Section 15.)

One of the key requirements of the NAMF is:


Target community levels of service are defined through community consultation, considering population and demographic change projections, trend analysis and customer feedback and requests.

This is a very broad criterion, at this stage there is limited information setting out what would be a model for assessing and determining service levels through community consultation.

The tests to be applied in assessing compliance with the NAMA requirement for levels of Service at the 'Core' level and the 'Advanced' level are set out in the table in Attachment 15.6 (Section 15). In essence the test addresses whether the tests to be applied are in compliance with the NAMA levels of Service at the 'Core' level:

- Council has service plans for each of its services developed in consultation with the community.
- Community levels of service and technical levels of service, and costs of providing the service to be incorporated into Asset Management Plans.
- Current and target levels of service (for both community and technical levels of service) are clearly defined in each Asset Management Plan.
- Technical levels of service to be incorporated into service agreements and/or maintenance, operational and capital renewal procedures.

Based on the above the NAMA requires levels of service focussed around elements such as demographics, community needs, economic considerations,



operational and capital renewal requirements, technical requirements and maintenance requirements.

However it is proposed that the levels of service should be developed having regard to a broader range of criteria that should be considered in the renewal, planning and provision of infrastructure assets. These may be less tangible from a community consultation perspective but that have an equally important bearing in determining levels of service. These elements may be considered as being 'intangibles' however the concept of 'liveability' provides a useful insight as to what these other dimensions might include. It is further proposed that the Levels of Service should be assessed with regard to Environmental Quality, Technical Quality, Economic Quality, and Socio-Cultural and Functional Quality considerations as outlined in the next section.

11 Establishing Levels of Service and Liveability

11.1 Role of Local Government


From an asset management perspective, local governments, being closest to the community, are able to influence liveability quality directly and indirectly through the implementation of State legislation and local policies covering such matters as waste management, urban planning, land use planning, implementation of the planning scheme, managing native vegetation and through leadership and interaction with the community. They can also influence liveability through their role in the provision, management and maintenance of public infrastructure assets such municipal roads, building facilities, parks and gardens.

Local Government also has a role within a broader context of local leadership on key strategic issues such as the environment. They are in a prime position to influence community behaviour and achieve environmental outcomes through interaction with local residents.

11.2 Levels of Service

The NAMAf assessment criteria suggest that the: *'Target community levels of service are defined through community consultation, considering population and demographic change projections, trend analysis and customer feedback and requests'*.

Local government is in a position to review its strategic targets, key indicators and performance in the preparation of the Council Plan and to influence community outcomes accordingly. Liveability measures could be used to contribute substantially to public policy development in terms of the planning, provision, management and maintenance of community assets. It also provides a useful framework for comparison of measures for prioritisation of service levels, projects and strategies etc.



The key elements of 'Liveability' provide a quantitative reference for assessing service levels, and a broader framework for consideration as part of any community consultation process. The liveability criteria, provide a higher order framework, and benchmarking when assessing levels of service (e.g. in that it provides a comparison between major world cities). While the criteria will differ for the different types of assets being assessed, it is possible to develop a 'model framework' which provides a guide as to the criteria that could be used for the assessment of service levels.

The following table provides a 'model liveability framework' of the elements to be assessed in the determination of service levels. The framework is grouped into four key criteria: Environmental Quality, Technical Quality, Economic Quality, and Socio-Cultural and Functional Quality.

The model liveability framework has been adapted from a paper presented at the IFME Conference (The DGNB Certification System: New Mixed City Districts *by Anders S., Germany*). The paper proposed a certification system integrating factors such as life cycle assessment, life cycle costs, changes to the local urban climate, biodiversity and habitat integration, transportation system quality, rainwater management, and energy, water and waste management.


The system was developed using the following key criteria,

- Economic Quality (Life Cycle Costs, Financial Performance),
- Environmental Quality (Environmental Impact, Resource Consumption and Waste Generation),
- Socio cultural and Functional Quality (Social Quality, Health Comfort and User Satisfaction, Functionality, Aesthetic Quality)
- Technical Quality (Technical Infrastructure, Technical Quality, Transportation/ Mobility)
- Process Quality (Participation, Planning Quality, Quality of Implementation)

The DGNB System was developed as a method to provide a Total Performance Index for a city district, calculated on the weighted sum of all points across the above criteria. The Index is a guide and indicates to what extent the defined requirements have been fulfilled. The proposed system was developed for new city districts and is oriented towards the ideal image of a compact and mixed-use European city. The certification process proposed provides a transparent and independent tool for assessing different development proposals and provides a quantitative framework, which allows future residents to objectively assess the quality of a city.

A number of the criteria in the model liveability framework are quantitative, and a number are qualitative and would need to be assessed on a 'perceptual level'. For example: is a facility/space/environment perceived as being safe/clean /comfortable?

While the perceptual criteria are difficult to quantify, these provide a useful insight into how the asset is performing from a user perspective as an outcome measure. These qualitative criteria also form a useful reference to assist with establishing community service levels. Both the qualitative and quantitative criteria are also



useful in the strategy planning, project planning and service planning processes as discussed further in the next section.

The 'framework' is by no means definitive, nor does it represent a complete set of factors for inclusion in the assessment process. However assuming the objective is to understand the overall contribution of the asset to influencing the quality of life or health and wellbeing of residents, the framework provides a useful reference as to the additional elements that should be considered when determining levels of service.

The framework is intended to be applied at a municipal level in the asset management process as explained in the next section. However the framework could equally be applied to assess joint responsibilities of multiple stakeholders including the State Government, according to the context in which it is applied.

11.3 Levels of Service Framework

In applying the process discussed the following table defines the 'Liveability Framework' and defines the criteria against the qualitative and quantitative elements of Environmental Quality, Economic Quality, Technical Quality and Socio-Cultural and Functional Quality. Within each element components are identified for consideration.

11.4 Levels of Service - Model Liveability Framework Table

Evaluation Group	Criteria Group	Criteria	Examples
Environmental Quality	Local Environmental Impact	Water and Soil Protection	<ul style="list-style-type: none"> Water sensitive urban design Stormwater filtration/treatment prior to discharge Soil surfaces vegetated/protected
		Changes to Local Urban Climate	<ul style="list-style-type: none"> Vegetation cover, Canopy/shade cover
		Biodiversity and Habitat Integration	<ul style="list-style-type: none"> Contribution to available habitat Indigenous vegetation utilised Variety of vegetation to contribute to micro environment
		Environmental Impacts	<ul style="list-style-type: none"> Net increase in available habitat/biodiversity
		Land Use	<ul style="list-style-type: none"> Minimise infrastructure footprint
	Resource Consumption and Waste Management	Primary Energy Demand	<ul style="list-style-type: none"> Low energy options utilised Energy efficient appliances, lighting etc.
		Energy Efficient Construction	<ul style="list-style-type: none"> Buildings thermally insulated Orientation of facilities
		Resource Friendly Infrastructure	<ul style="list-style-type: none"> Solar lighting Utilisation of eco-friendly materials e.g. 'green concrete'
		Water Cycle management	<ul style="list-style-type: none"> Rainwater harvesting and re-use Grey water harvesting and re-use Water sensitive Urban Design
		Waste Management Arrangements	<ul style="list-style-type: none"> Public place recycling Availability of waste disposal facilities Location of bins



Economic Quality	Life Cycle Costs	Life Cycle Costs	<ul style="list-style-type: none"> • Renewal expenditure
		Ongoing operating costs	<ul style="list-style-type: none"> • Minimise ongoing operating costs
		Value Retention	<ul style="list-style-type: none"> • Ensure maintenance activity maintains residual value of the asset
		Efficient Use of Space	<ul style="list-style-type: none"> • Minimise infrastructure footprint to meet functional need
	Financial Performance	Social & Functional Diversity	<ul style="list-style-type: none"> • Flexibility of use, facility supports alternate uses/activities
		Social & Commercial Infrastructure	<ul style="list-style-type: none"> • Flexibility of use supports commercial activities, alfresco dining, markets etc.
Technical Quality	Technical Infrastructure Technical Quality	Quality of fixtures and fittings	<ul style="list-style-type: none"> • Quality of fixtures and fittings suited to intended use, minimum maintenance required
		Ease of Cleaning & Maintenance	<ul style="list-style-type: none"> • Easy access available for cleaning and maintenance
	Transportation and Mobility	Provision of cycling infrastructure	<ul style="list-style-type: none"> • bicycle paths • bicycle parking
		Provision of pedestrian access	<ul style="list-style-type: none"> • Pedestrian paths/access
		Provision for access by private vehicle (Car parking, access)	<ul style="list-style-type: none"> • Provision of car parking, car parking access in close proximity
		Proximity of public transport access	<ul style="list-style-type: none"> • Proximity to public transport • Easy access from public transport
	Integration with other authority infrastructure	Project integrated with other authorities	<ul style="list-style-type: none"> • Service authorities etc.



Socio-cultural & Functional Quality	Social Quality	Perception of Security	<ul style="list-style-type: none"> • People 'feel safe' • Adequate lighting • Adequate sight lines • CEPTED principles
		Appearance – Cleanliness, graffiti etc.	<ul style="list-style-type: none"> • Spaces clear of litter, sediment, dust, dirt • Graffiti removed promptly • No residual graffiti • Vegetation maintained, grass cut • Garden beds managed/maintained
	Health & Wellbeing	Physical Condition of infrastructure	<ul style="list-style-type: none"> • Assets maintained to meet appropriate current standards • Visual appearance, no excessive cracking, spalling, discolouration
		Atmosphere in Public Spaces	<ul style="list-style-type: none"> • Spaces at a human scale, presence of activity, seating, life, water etc. • Vegetation for screening
		Noise control	<ul style="list-style-type: none"> • Sound attenuation as necessary
	Comfort & User Satisfaction	Availability of spaces/facilities	<ul style="list-style-type: none"> • Flexibility of spaces for primary use and alternative uses
		Accessibility – disabled access	<ul style="list-style-type: none"> • Available ramps, lifts • Disability access building standards
	Functionality & Aesthetic Quality	Flexibility of Use	<ul style="list-style-type: none"> • Flexibility of spaces for primary use and alternative uses
		Urban Planning Integration	<ul style="list-style-type: none"> • High quality design • Functional spaces
		Urban Design - aesthetic quality of infrastructure	<ul style="list-style-type: none"> • High quality materials
		Existing use of buildings/ facilities	<ul style="list-style-type: none"> • Effective utilisation of existing facilities
		Integration of Public Art	<ul style="list-style-type: none"> • Elements of public art included/displayed



12 Asset Planning and Management Process

12.1 The process

The preparation of asset management plans and the assessment of service levels for an asset class provides an opportunity to examine how those assets are responding to community expectations such as environment, community needs, liveability, economic and strategic requirements. Generally the process involves assessing current and future anticipated community needs and identifying ongoing capital and operational funding requirements to ensure the asset is fit for purpose. There is an obligation to provide adequate funding to ensure assets deliver optimal effectiveness and liveability.

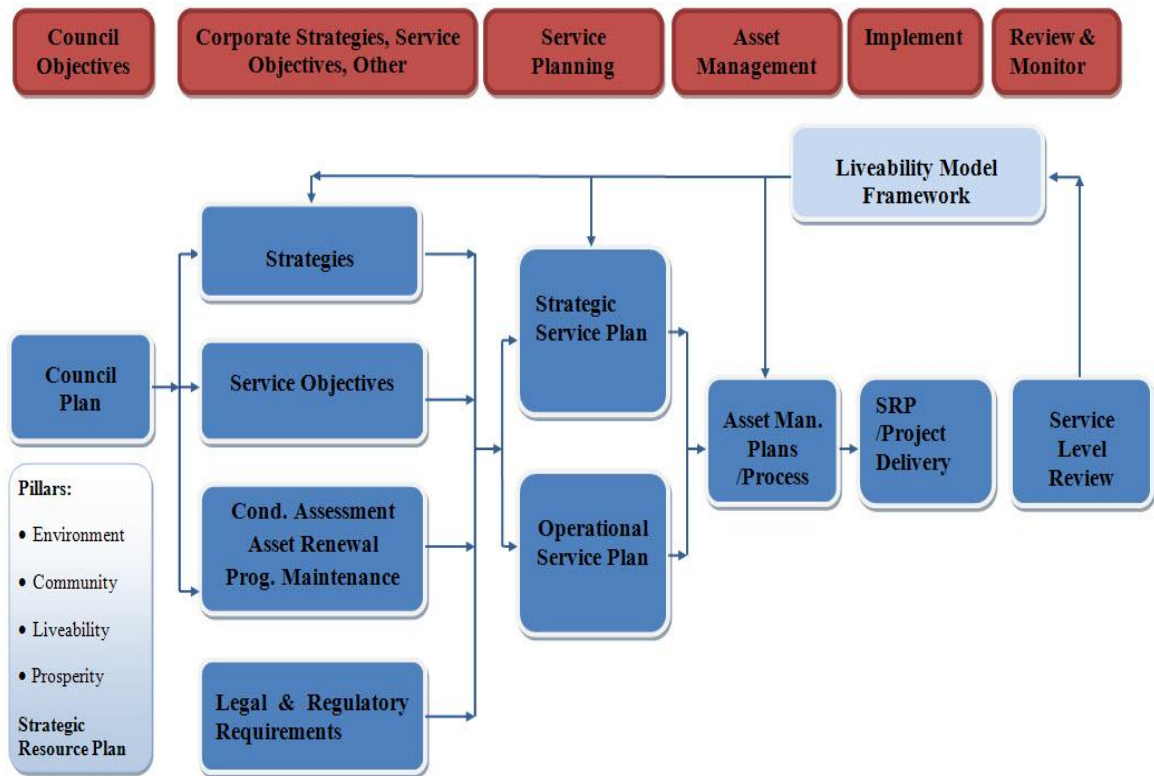
Many municipalities employ a 'triple bottom line' or 'quadruple bottom line' approach to the evaluation and assessment of capital project proposals as part of the preparation of their capital budgets. These types of evaluation frameworks typically include factors such as social, environmental, and economic factors. However at a project level the criteria, while consistent with the model framework, may be quite limited.

Asset Management Plans should reflect the strategic and operational imperatives of the organisation, and incorporate other imperatives such as legislative requirements, asset maintenance and renewal requirements. The process of informing the preparation of Asset Management Plans while being a relatively linear process will involve a number of inputs. The inputs will vary from municipality to municipality depending on both the process and the imperatives.

Represented in the following conceptual diagram is the relationship between the Council Plan, and the preparation of Asset Management Plans. From an asset management perspective, corporate strategies and corporate service objectives, combined with other inputs such as asset renewal requirements, programmed maintenance requirements and regulatory requirements, inform the service planning at both an operational and service level, which become inputs to the asset management plans.

The NAMAFL Levels of Service key assessment criteria are generally assessed using Community, Technical and Economic levels of service criteria. It is proposed that the levels of service should be developed having regard to a broader range of criteria that should be considered in the renewal, planning and provision of infrastructure assets. Based on the above analysis it is proposed that the additional criteria of Environmental Quality and Socio Cultural and Functional Quality should be considered as part of the evaluation process. This will ensure that assets are delivered to meet social priorities, needs and demands both now and in the future.

ASSET MANAGEMENT PLAN – INPUTS/OUTPUTS/OUTCOMES



In the above process flow chart the model liveability framework has been added to the process diagram and is a valuable reference for establishing service levels and monitoring and providing feedback on the outcomes (rather than outputs) of the delivery of the strategic and operational initiatives against those service targets. As outlined above there is a correlation between the imperatives employed in the evaluation phase of proposed capital projects and/or service initiatives, and the criteria proposed in the model liveability framework for the service level review process.

In summary, it is proposed that the model liveability framework could also be used at each stage in the process to ensure that the proposed development/service initiative incorporates those features which will influence the quality of life or health and wellbeing of residents and that these same criteria be applied when assessing service levels. As such the service level review outcomes become inputs into the project/program/service planning phase as well as to the preparation of asset management plans. This ensures that there is a consistency between the evaluation/assessment and prioritisation of initiatives at the planning stage with the outcomes achieved through the delivery of those initiatives in terms of liveability.



13 Conclusion

Local Government also has a role within a broader context of local leadership on key strategic issues and in influencing the quality of life or health and wellbeing of its residents. They are in a prime position to influence community behaviour and achieve these outcomes through interaction with local residents.

The concept of 'liveability' is used to describe the overall contribution of the urban environment in influencing the quality of life or health and wellbeing of residents. There are a number of international studies which measure the 'liveability' of cities around the world. These studies use a range of criteria in the assessment process. The criteria provide a valuable insight into the factors that influence the quality of life or health and well being of residents.

It is evident that the cities that score highest in the liveability assessment tend to be mid-sized cities, in wealthier countries with a relatively low population density. (Refer to Attachment 15.5, Section 15). These cities can provide a range of cultural and recreational opportunities without leading to high crime levels or overburdened infrastructure. Larger cities tend to suffer a higher crime rates and overstretched infrastructure with congestion and public transport problems.


It is evident as cities evolve beyond a 'mid-size' that there is primary need to continue to invest in liveability elements to ensure that the qualitative social elements that affect community well being are continually being addressed with ongoing densification. Accessibility to good quality, well maintained infrastructure including transport/mobility networks, green spaces and urban public spaces is paramount in retaining and enhancing liveability.

Assessing the criteria used in the international surveys and various reports to the Victorian Competition and Efficiency Commission outlined above it is evident that from an infrastructure maintenance perspective the key elements that affect liveability include:

- Built infrastructure
- Amenity and Place
- Environment and Sustainability
- Transport and Mobility
- Innovation.

There is a direct link between liveability and competitiveness. The liveability of a city contributes to its competitiveness as this draws the best human talent. The urban form can and does influence the extent to which residents can satisfy their needs and enjoy high levels of wellbeing. Cities where liveability and wellbeing are the primary goals of the community and where the urban environment is developed to support community needs are generally more competitive from an economic perspective.

The Economist Intelligence Unit, part of *The Economist*, a US-based magazine, rated Melbourne as the most liveable city in 2011 and 2012 based on an evaluation of 140




cities worldwide, narrowly beating Vancouver. While Melbourne City may have been recognised as being the 'most liveable city 2011 and 2012' there is question about current urban planning policy for the whole metropolitan area in terms of future liveability.

Ongoing densification of inner city areas without adequate requirements for the provision of open space continue to draw down on existing open space in terms of m² per head. The Victorian Environmental Assessment Council (VEAC 2008) report 2008 'Metropolitan Melbourne Investigation', recognises the provision of open space, parks including waterways and recreation areas and their contribution to improving liveability. There are already deficits in terms of the distribution of open space in the metropolitan area, as densification occurs both the distribution and average area per head of population will decline. The current provision in the Subdivision Act 1988, for a 5 per cent open space contribution does not compensate for the loss of open space amenity and liveability associated with ongoing densification of inner metropolitan areas. The implications are that liveability and amenity of the metropolitan area are being continually degraded. It would be more appropriate for the open space contribution to be linked to the development outcome (residential and commercial), rather than as a proportion of land value, and to be mandated under the Planning and Environment Act, rather than through the Subdivisions Act.

Further, the current land use development patterns in Melbourne support continued 'urban sprawl' which is not reflective of the principles of liveability such as the 'Compact City' which would see the development of a metropolitan core and municipal town centres. Continued population growth and expansion of the urban area are recognised by leading industry commentators as threats to the sustainability and liveability of the city, and the wellbeing of its residents. Further urban expansion without concentrating factors such as housing mix, service provision, employment in urban centres can lead to a poor outcomes (e.g. social stratification, extended commuting times, difficulties for providing transportation infrastructure, lack of access to work and other services with consequent traffic increases etc).

These concerns are continually reinforced in ongoing public debate and have been reinforced recently by prominent practitioners in the field. These threats to liveability have been recognised by many European cities visited. The level of urbanisation is increasing with just over 50 per cent of the world's population currently living in cities, this figure is expected to grow to 70 per cent by 2050. In the face of dramatically increasing population their urban planning frameworks both limit ongoing urban sprawl and ensure that new developments/urban renewal projects address the elements of environmental sustainability; economic sustainability; technical quality; and socio-cultural and functional quality.

Various studies cited in the body of the report note that with increased population density, the importance of maintenance, management and distribution of assets for liveability also increases. Anecdotal evidence from a number of European Cities is that there has been a shift in emphasis, where residents want more from urban and public open spaces, particularly with increasing densification. In response some European Cities are placing a much greater emphasis on urban design, and creating



social value adding outcomes with both urban development/renewal projects and infrastructure upgrade projects.

At a municipal level, while recognising the limited control over urban planning, there is an urgent question as to how liveability considerations can be embedded into management practices. Asset Managers tend to concentrate on the provision, management and maintenance of infrastructure which is responsive to local needs such as roads, drains, urban spaces, trees, and recreational facilities, etc. Importantly, the quality of these assets has a large bearing at a regional, national and international level in terms of the perception of what is desirable place to live. The overall contribution that these assets and facilities make to the 'liveability' of a place is often overlooked in terms of assessing levels of service.

A model liveability framework has been developed on the basis of the criteria used in the above liveability studies. The framework is grouped into four themes; Environmental Quality; Economic Quality; Technical Quality; Socio-cultural and Functional Quality. The liveability framework provides a useful tool for the determination of service levels for asset management purposes, and can equally be employed in the planning phase and for the assessment of capital and service planning initiatives.



13.1 Acknowledgment

I wish to thank the Municipal Engineers Foundation for providing the opportunity to participate in the Study Tour. Attending the IFME Conference, to hear presentations from different counties outlining their approach to achieving 'Sustainable Communities' (Conference theme) was invaluable.

Further the opportunity to visit colleagues in other leading cities throughout Scandinavia and Northern Europe provided extremely valuable insights into the challenges they face particularly relating to population shifts and resource scarcity and the way they are adapting to these challenges.

The lessons learned both at the Conference and through the municipal visits provide valuable insights that can be applied here in Victoria. The study tour allowed me to develop the ideas expressed in this paper, which reinforce the attributes that make Melbourne one of the most Liveable Cities in the world, and provide an insight into the role asset management at a local government level plays in achieving this outcome.

14 Recommendations

	Goal	Action
1.	Promote use of liveability criteria in the assessment of community service levels at a local government level.	1. Promote the use of a broader set of criteria as set out in the Model Liveability Framework in the assessment and determination of community service levels as part of the asset management process.
2.	Integrate liveability criteria in to service planning for asset management.	<p>2. Revise industry standard service level plan templates for asset management at to incorporate the criteria in the Model Liveability Framework.</p> <p>3. Review the roles of the Service Manager and the Asset Manager in achieving liveability outcomes through the planning, delivery, operation, management and maintenance of municipal infrastructure.</p> <p>4. Work with industry MAV Step Asset management/NAMAF industry providers as appropriate to integrate the Model Liveability Framework criteria into the industry standard service level plan templates for asset management.</p> <p>5. Review and revise community survey methodology used for assessing community service levels in the asset management process to ensure that the criteria identified in the Model Liveability Framework are incorporated.</p>
3.	Integrated Strategic Planning	6. Develop strategy framework aligned with the Council Plan which provides an integrated approach to urban development addressing elements such as maintenance and enhancement of open space, transport and mobility, and environmental sustainability.



<p>4.</p>	<p>Improved Capital Planning of public works.</p>	<p>7. Ensure the process for process for planning, design, implementation, operating and management of infrastructure assets is aligned with the strategic objectives and service objectives identified in the Council Plan.</p> <p>8. Develop a capital evaluation process to ensure that the criteria identified in the Model Liveability Framework are actively assessed in the prioritisation of capital expenditure for new, upgrade, renewal, and maintenance expenditure.</p> <p>9. Develop methodology to ensure the criteria in the Model Liveability Framework are incorporated into the process for evaluation, design, development and delivery of key infrastructure projects.</p>
<p>5.</p>	<p>Planning Scheme Amendment to link open space provision with development outcome.</p>	<p>10. Pursue amendments to State Planning Policy to ensure open space provision is related more directly to the development outcome, particularly in the Melbourne metropolitan areas so as to preserve and enhance liveability with ongoing population increase and densification.</p>
<p>6.</p>	<p>Liveability principles to be imbedded into the day to day business of Asset Management</p>	<p>11. Review organisational structure to achieve a vertical alignment between urban design, landscape design and civil infrastructure design and delivery, and asset management to ensure integrated the liveability principles are imbedded in the planning delivery and maintenance of infrastructure.</p>

15 Attachments

15.1 Most Liveable Cities

15.1.1 Monocle's Most Liveable City

Monocle annual the Quality of Living Survey, comparing 25 cities, the top ten being:

Monocle's Quality of Living Survey 2011		
Rank	City	Country
1	Helsinki*	Finland
2	Zurich*	Switzerland
3	Copenhagen*	Denmark
4	Munich*	Germany
5	Melbourne*	Australia
6	Vienna*	Austria
7	Sydney	Australia
8	Berlin	Germany
9	Tokyo	Japan
10	Madrid	Spain

*Cities visited.

15.1.2 Economist Most Liveable City

The Economist Intelligence Unit's liveability survey is released annually, comparing 140 cities based on 30 criteria.

Economist Most Liveable Cities 2011		
Rank	City	Country
1	Melbourne*	Australia
2	Vienna*	Austria
3	Vancouver	Canada
4	Toronto	Canada
5	Calgary	Canada
6	Sydney	Australia
7	Helsinki*	Finland
8	Perth	Australia
9	Adelaide	Australia
10	Auckland	New Zealand

*Cities visited.




15.1.3 Mercer Quality of Living Survey

Mercer releases the Quality of Living Survey annually, comparing 221 cities based on 39 criteria.

Mercer 2011 Quality of Living Survey		
Rank	City	Country
1	Vienna*	Austria
2	Zurich*	Switzerland
3	Auckland	New Zealand
4	Munich*	Germany
5	Dusseldorf	Germany
6	Vancouver	Canada
7	Frankfurt	Germany
8	Geneva	Switzerland
9	Bern	Switzerland
10	Copenhagen*	Denmark

*Cities visited.



15.2 Summary of IFME Papers

The following is a brief summary of the papers presented at the IFME Conference in Helsinki (2012) which were the most relevant and informed the preparation of this report.

15.2.1 Building Modernization and Urban Infill Development in the Finnish Context: A State of Art Study of Sustainability Assessment Frameworks

Cronhjort Y., le Roux S., Finland

Current challenges for sustainable refurbishment and urban redevelopment in Europe are based on the increasing demand on renovation of existing building stock, the demand for increased energy efficiency of both existing and new buildings, the demand on limiting urban sprawl and the demand for social sustainability.

The paper identified the need to establish a balance between demolition and new additions to ensure cost efficient and environmentally sustainable solutions.

The paper illustrated the need to develop a framework for the assessment of environmental impacts, a lifetime overview of the urban economic and social development and single building modernizations including the phases of operation, use and maintenance of buildings after refurbishment.


The challenge for urban redevelopment is to balance technical, environmental, economic and social considerations.

15.2.2 How Are We Heading towards Sustainable Facilities Management in Norwegian Municipalities?

Valen M., Olsson N., Norway

The paper undertook a study of thirty-one municipality's facilities management strategies and outcomes, in an attempt to map cause and effect. Issues studied included governance of facilities management, maintenance strategies, maintenance lag, facilities management competence and experiences from use of internal rent.

The study identified important key success factors for achieving a desired and sustainable standard for municipal buildings as having established long term objectives and strategies including maintenance and management plans that are supported at a political level. Systems including proper governance, systems for



prioritising works, competence and organisation, technical data including condition assessments are important factors in successful facilities management.

Contrary to what was expected, the paper found that there was no direct relationship between the technical condition state and maintenance costs.

The survey confirms that the municipalities which govern their activities based on a long-term plan and aligned with political objectives for their building portfolio, are successfully operating value driven facilities maintenance in the long term.

15.2.3 The DGNB Certification System: New Mixed City Districts

Anders S., Germany

This paper proposed a certification system integrating factors such as life cycle assessment, life cycle costs, changes to the local urban climate, biodiversity and habitat integration, transportation system quality, rainwater management, and energy, water, and waste management.

The system was developed using the following key criteria,

- **Economic Quality** (Life Cycle Costs, Financial Performance),
- **Environmental Quality** (Environmental Impact, Resource Consumption and Waste Generation),
- **Socio cultural and Functional Quality** (Social Quality, Health Comfort and User Satisfaction, Functionality, Aesthetic Quality)
- **Technical Quality** (Technical Infrastructure, Technical Quality, Transportation/ Mobility)
- **Process Quality** (Participation, Planning Quality, Quality of Implementation)

The Total Performance Index of the city district is calculated based on the weighted sum of all points across all criteria, and indicates to what extent the defined requirements have been fulfilled.

The proposed system has been developed for new city districts and is oriented towards the ideal image of a compact and mixed-use European city. The certification process proposed provides a transparent and independent tool for assessing different development proposals and provides a quantitative framework, which allows future residents to objectively assess the quality of a city.



15.2.4 Kangas, urban development project for tomorrow

Anne Sandelin Director of Urban development projects Urban Planning and Infrastructure, City of Jyväskylä Finland

In the last ten years Jyväskylä has been one of the fastest growing cities in Finland. In 2010, there were 1047 homes completed, of which 827 blocks of flats and terraced houses and 220 single family houses. The Region's population growth over the period 2001-2010 was an average of 1 747 persons / year. Jyväskylä, the population estimate for the year 2020 is 141,620 inhabitants. Achieving this goal depends on ensuring new areas for attractive housing and employment areas. The city needs to maintain a two-year building site reserve for of 400 new single-family houses and 160,000 m² land of the other housing production.

As an answer these needs, after 130 years of paper manufacturing, Kangas paper mill was closed by Sappi Finland Oyj in the summer 2010. Located about 1 km from the city centre, an area of 27 hectares became property of the City of Jyväskylä in November 2nd in 2011. Kangas-project is the main urban development project of Jyväskylä for the next decades. The old mill is 60.000 m², and is to be transformed into a city of the future.

The principles for the development are outlined as follows;

HEART: Experiences, vibrancy and sense of community; Old paper mill turns into a beating heart of new, hybrid area for working, housing culture and services.

FOOT: Attractive pedestrian environment and a possibility to live car free life. Fast bicycle lanes, underground parking and maintenance routes.

SUSTAINABLE development: Dense urban structure, ecological way of life, towards carbon neutral city

GREEN areas: Water and green areas, from nature preserved areas to parks, balconies and roof tops.

These principles reflect many of the liveable city principles, used in a number of urban redevelopment projects.



15.2.5 Service Planning – The missing link in Sustainable Asset Management

Ross Goyne, Director, Ross J Goyne Consulting Pty Ltd

Service planning in local government has been identified as an important component in sustainable asset management. A review of the performance of local governments under the National Asset Management Assessment Framework confirms that service planning is achieving lower scores relative to the other elements in the scoring process.

Service Planning, which includes determining levels of service, directly informs the various asset management plans of the need for infrastructure assets and the service they need to perform.

Local governments exist to provide services to their community. The Council determines a vision, in conjunction with its community, and then defines specific services to support the achievement of that vision. Infrastructure assets should then only be provided where they directly support the delivery of the agreed services.

Service planning defines the service, the level of service required and how and when the service is to be provided. Service delivery can include asset and non-asset solutions.


Where asset solutions are adopted, the infrastructure should be planned and designed to provide the required level of service in the most cost-effective manner.

In Victoria, the Local Government Act 1989 highlights the need for regular service reviews in accordance with the Best Value Principles to enable a council to assess the effectiveness and efficiency of its services, and to take action where necessary to assure its services continue to meet the community's needs.

The six principles to guide how a service should be monitored and reviewed on an ongoing basis are:

- all services should be responsive to community needs
- each service should be accessible to those community members to whom the service is intended
- a council should achieve continuous improvement in the provision of services to its community
- a council should develop a program of regular consultation with its community in relation to the services it provides
- all services provided to the community should meet cost and quality standards set by the council.

Asset management plans, are typically based on this technical “asset focused” viewpoint and need to reflect the critical link between service needs and Service Planning



Service level Plans should link the current levels of service, with future service needs developed in response to community needs, how the transition is to occur and what resources are required, including infrastructure asset provision and maintenance.

15.2.6 Experiences from "The Liveable City"

Anki Ingelström

Architect

Swedish Transport

Administration Sweden

Carl-Johan Engström *Professor in*

Urban and Regional Studies

Royal Institute of Technology

Sweden

The Liveable City project was a joint project between Swedish national agencies and three medium sized municipalities spanning a period of six years between 2005 and 2010. The aim of the project was to develop processes focusing on the interrelationship between the planning of urban transport systems and the built environment. The focus was on how different interests, requirements and needs are managed in a coordinated manner to achieve sustainable urban development.

The population of the metropolitan regions and large cities are constantly increasing. More and more people tend to move there to benefit from the range of services, culture, entertainment, work opportunities and education possibilities they offer.

New creative urban development projects must always involve the social dimension. For example, a street will always have the function of facilitating transportation of some kind. Up until now, this way of looking at it has always dominated, but it also accommodates a social aspect in the form of an approach to traffic safety. If on the other hand the street is viewed as a human residential zone, the perspective changes. Attractiveness, safety and comfort become goals equally worth achieving – and the result is some very different solutions,

The experience derived from The Liveable City project is that solutions must be based on the overall objectives for sustainable urban development.

The finding from the Liveable City project recommended joint approach to city infrastructure planning both at a regional and sub regional level to link communities with facilities and employment opportunities. The study recommended a municipal policy for coordinated urban development must enhance the strategic focus of spatial planning.

This paper reinforced the need for integrated planning, particularly special land use and transport infrastructure planning.

15.3 Summary of City Interviews

15.3.1 Helsinki City Council – Finland

Background

The Helsinki Metropolitan Area includes four municipalities, the city of Helsinki and three other cities: Espoo and Vantaa, which immediately border Helsinki to the west and north, respectively; and Kauniainen, which is an enclave within the city of Espoo. The Helsinki metropolitan area is the world's northernmost urban area among those with a population of over one million people, and the city is the northernmost capital of an EU member state.

The municipality has an area of 214 sq km, with a population of 595,000 and a density 2,752 people per sq km. Helsinki is Finland's major political, educational, financial, cultural and research centre as well as one of northern Europe's major cities. Approximately 70% of foreign companies operating in Finland have settled in the Helsinki region. In 2009, Helsinki was chosen to be the World Design Capital by the International Council of Societies of Industrial Design.



Finland was ranked first in the world in environmental sustainability out of 146 countries on the 2005 Environmental Sustainability Index – prepared by Yale & Columbia Universities.

The City of Helsinki is one of 350 municipalities throughout Finland. The predominant source of funding is through income tax imposed federally. They have a high level of debt of approximately 2,200 euro. per head of population (e.g. AUD \$2,750)

Municipalities in Finland have responsibility for schools, hospitals and other services including utilities. They operate a district heating system which provides heat to a large number of apartments within the city. A large number of maintenance services are contracted out.

Liveable City Attributes

- public transport modes include trains, trams, buses
- feature of alfresco dining in public spaces
- large open spaces, multiple public squares
- avenues of trees (street trees are a priority, valued by residents)
- not a lot of traffic on street
- substantial building stock in very good condition
- not many litter bins
- high quality streetscape, paving
- public art is a feature
- markets, public spaces activated with live performances, markets etc.
- SMS messaging to residents when street sweeping to occur



Sustainability

Their target is for a 20% reduction in their carbon footprint by 2020. The use of bio-fuels for power station instead of carbon based fuels will achieve the reduction. They also have very high domestic recycling rates of around 90%.

Helsinki has/is in the process of undertaking some very bold urban design/infrastructure improvement projects which continue to enhance the liveability of the city. The recently completed underground road system sees key activities such as commercial deliveries to large retail outlets conducted underground. Also created underground are hundreds of car parking spaces. They have gone to the extent of locating the Council works depot underground. These initiatives reduce traffic volumes and take large vehicles out of the central business/shopping precinct. This sort of innovation also allows the opportunity for areas at ground level otherwise occupied by those activities to be returned for public open space - parks, congregation spaces etc. These initiatives provide opportunities for recreation, congregation, outdoor (alfresco) dining etc. which all contributes toward being pedestrian and people friendly and consequently more liveable.

Helsinki is almost a peninsula; around 77% of daily commutes into the city are taken by public transport. The public transport system is supported by an extensive underground train system, and a bus and tram system. The Helsinki Council is planning further improvements to the train system, to provide an underground loop so that there is a continuous loop to circulate the train services underground. They have also recognised the need to provide further transport network improvements to improve/reduce the cross city traffic journeys.



They have also taken a strong position with the planning and development/urban renewal of their waterfront areas around the harbours to provide a continuous foreshore network of paths and parks. Housing is set back behind the open space network which provides public access to the water, beaches and protects the views for the properties that sit behind the park belt. The JATKASAARI precinct town plan being only 1.5km from the city centre will see the former port service area, be developed with street front shops, sidewalk cafes, parks, beach boulevards and residential areas to house 16,000 residents and provide 6,000 new jobs.



Their current unemployment rate is approximately 8%.


15.3.2 Tallinn - Estonia

Tallinn is the capital and largest city of Estonia and occupies an area of 159.2 km² (61.5 sq mi), with a total population of 416,000. The structure of Government is 2 tiers with State and local government.

It is situated on the northern coast of the country, on the shore of the Gulf of Finland, 80 km (50 mi) south of Helsinki, east of Stockholm and west of Saint Petersburg. Tallinn's Old Town is in the list of UNESCO World Heritage Sites. It is ranked as a global city and has been listed among the top 10 digital cities in the world.[4] The city was a European Capital of Culture for 2011, along with Turku, Finland.

The principle funding sources include income tax 53%, state support 24% the balance is locally applied taxes, fees, charges and dividends. In terms of total expenditure a relatively small proportion is dedicated to road based infrastructure with 5% of the budget spent on engineering and 7% on streets & pavements.

The city has developed a strategy 'City Development Strategy 2030'. The strategy is supported by the long term budget, developed for the period 2012-15. The forward budget includes approximately 30% dedicated for capital works with 70% for operating expenditure. Sectoral development plans are used to prioritise expenditure. Active monitoring to ensure long term objectives are met.



The delivery of the plan is measured by annual community surveys including; annual satisfaction survey using focus groups, different survey methods are for minority groups e.g. ethnic minorities.

The biggest issue facing the city is the infrastructure renewal gap, particularly following the GFC in 2008. Budgets have been re-prioritised towards the provision of social services.

Estonia has a current unemployment rate of around 10%. The rate of unemployment has increased as there has been a large downturn in the construction industry since the GFC in 2008, of approximately 50%. They have a significant problem with the retention of educated young people, who are leaving for better prospects elsewhere in the EU.

In terms of sustainability the government offers a subsidy program for individuals to retrofit existing houses. The State and Local Governments have active programs underway to renovate schools/hospitals so as to reduce energy consumption. They have a certification system to ensure new developments and new houses are built to energy efficient standards. They are also trialling new transport fuels for trams/buses and cars including electricity and gas.

15.3.3 Stockholm - Sweden

Stockholm City has a population of approximately 800,000 (2010), with a total metropolitan population of approximately 2m. The City is undertaking numerous urban renewal projects involving the redevelopment of government owned land as a result of major infrastructure upgrade projects. Some of the current projects are described briefly below. The developments generally adopt the key liveability attributes as objectives as outlined below.

Hagastaden

New area to be constructed and developed into an entirely new neighbourhood with a mixture of housing, parkland, trade, world leading research and highly specialised medical care. The development will include 3000 apartments, with around 13,000 workplaces as well as a central area with restaurants and cafes.

(Hagastaden - moving towards a world-class Stockholm, City of Stockholm, Feb 2011)

Norra Djurgårdsstaden Stockholm Royal Seaport Hjorthagen

The development is sited in areas previously used for gas production and other industry. The ports operations will be modernised and concentrated on piers, while the container and oil handling will be moved elsewhere. The development will include 10,000 new homes and 30,000 new jobs.



A ten minute bike ride from the Central Station the district will offer a wide variety of jobs. The area is being developed by a number of developers and architects, to ensure variation and an even distribution of rented and tenant occupied houses, interspersed with housing for the elderly and students.

The project includes the reuse of a number of existing industrial buildings. The former gas works will be home to a

cultural cluster, public buildings such as preschools, library, museum, shops and homes.

The objectives of the project include developing an environmentally sustainable city district with a genuine city environment with emphasis on technological innovation, building work using energy efficient materials, as well as minimising energy consumption.

A related project is the E20 European Highway, the North Link, Norralanken. The north link is a 5km ring road that will mainly be built in tunnels. The motorway will link to the sea port and take half of the existing 50,000 vehicles per day which use the road network which will create a safer and cleaner environment for pedestrians and cyclists.




Objectives of the Stockholm Royal Seaport project

The objectives of the above project provide a useful reference, and define the core objectives for all of the urban renewal/redevelopment projects visited;


- **Social**
 - Good access to public and commercial services
 - A safe living environment for children and adults
 - Successful integration of old and new
 - Proximity to park and green spaces and good recreational opportunities

- **Environmental**
 - Reduce climate impact
 - Tackle polluted areas
 - A healthy living environment
 - Safeguard and develop biodiversity

- 
- **Economic**
 - Effective land reuse
 - Make the most of the central location (access to existing services)
 - Encourage good entrepreneurial climate
 - **Physical Space**
 - Accessible, vibrant and varied urban development
 - Protect and safeguard the historic built environment
 - Safeguard the valuable cityscape and landscape
 - Excellent public transport provision and pedestrian and cycle paths

Principles applied to the development include the following

- **Transport**
 - Priorities links for cycle paths and pedestrian paths
 - Limited parking Stockholm Royal Seaport 0.5 car spaces per household, underground car parking
 - Low number of car parking spaces required for offices and retail premises
 - Prioritise walking and cycling, then public transport and car sharing schemes
 - Bicycle hire
 - Parking facilities for a number of bicycles for each apartment
 - Sites for car share schemes, car pooling systems
 - Public art - Stockholm 1% of total spend dedicated to public art
 - Congregation spaces, meeting spaces, large communal spaces for cultural activities (e.g. markets, and events) squares, walks.
- **Environment**
 - Creation of green corridors, for habitat, localised planting to improve micro climate
 - Provision of easy access to parks and green spaces for relaxation, recreation and sport.
 - Developers required to provide high level of green cover in inner courtyards, and rainwater management systems
 - Stormwater managed WSUD to provide for watering local planting, trees & vegetation and other green spaces, urban wetlands
 - Linkages to commercial areas, shops, schools, cultural facilities (libraries, sports facilities) medical facilities
 - Integrated basic facilities, supermarkets
 - Traffic and parking relocated underground, to free up surface for pedestrians and cyclists
 - Retention and reuse of existing buildings where possible
 - Public transport network access, including provision of light rail, trams, buses and access to the main train network

- 
- **Energy**
 - Buildings to be energy efficient
 - Energy to be renewable, buildings to be designed to include their own solar/wind energy generation

 - **Waste**
 - Nutrients to be stripped from stormwater and sewerage
 - Food receptacles provided in buildings to keep food waste for biogas production
 - Developments to include provision for recycling

 - **Information**
 - Information made available on consumption, costs and usage e.g. daily use of hot water and electricity

Sustainability

Stockholm was named Europe's first Green Capital for 2010 following a competition with 35 other European cities. Stockholm has actively been pursuing environmental and climate goals for many decades.


Stockholm has very low carbon emissions of 4 tonnes of greenhouse gases per resident. The City has long-term goal is to be fossil fuel-free by 2050, and has established the ambitious target of reducing greenhouse gas emissions to 3 tonnes per resident by 2015.

Initiatives include district heating production that is 80 per cent renewable, Including waste into energy conversion, investment in increased biogas production for vehicles with a vision is to become an "electric car city" by 2030, extensive retrofitting of existing building stock to increase energy efficiency of Council owned buildings. The City has an extensive public transport network based on renewable fuel and its tradition of sustainable city districts with exciting architecture and a comprehensive perspective on energy, waste and transport. This is supported by an extensive network of open space.

15.3.4 Staffanstorp - Sweden

The city is close to Malmo (25km) and will serve as a residential location for the workforce to serve both Malmo and Copenhagen. With approximately 80% of the workforce (8,000) travelling outside the City for work there is a need to improve public transport. One of the largest rail duplications in Sweden is currently being undertaken in the municipality, which will improve the city linkages.

The current population of Staffanstorp is 22,000 (2012), projected to increase to 39,000 by 2038. The City is home to 1900 registered companies, and has been certified by WHO (World Health Organisation) as a safe city.



The mean distance to travel to work is 10km, with 70% of commutes taken by car and 30% by public transport and bike. A further 3,000 employees travel to Staffanstorp daily to work.

City Budget

Income

Income tax of 18.89% collected at a federal level, provided to local government. The budget for Staffanstorp is summarised as follows;

Total budget E90m (AUD \$113m).

Income sources

- Income tax 75%
- Fees 3%
- Contributions 10%
- Other 12%

Expenditure

- Schools & Children 45%
- Elderly 17%
- College 13%
- Administration 13%
- Social/Culture 8%
- Planning, Engineering, Waste 4%

Sugartown Redevelopment

Some years ago the City purchased an old sugar mill site. Planning is currently underway for development of the site, 60% of land is owned by the municipality and will be used as a catalyst for the redevelopment project. The process commenced in 2009 by defining a vision for the site which is not to compete with the city centre. Objectives for the redevelopment project adopt many of the sustainable city/liveable city principles as outlined below.

The development will include a total of 1,000 new dwellings with a business mix. The project has been through an EOI process for professional services, and has progressed to concept design stage. The project will incorporate a number of phases of stakeholder consultation.

The principles adopted for the redevelopment include; sustainable lifestyle, stormwater harvesting, meeting places, protect heritage buildings, proximity to public transport, diversity of housing, recreational opportunities, cultural opportunities, spaces for activities, social spaces, good environment for businesses to operate, include provision for schools, biodiversity, green spaces, green roofs sustainable energy supply.

15.3.5 Malmö - Sweden

Malmö is Sweden's third largest city by population after Gothenburg and Stockholm, and is one of the largest cities in Scandinavia.

The Municipality has a population of 300,515 inhabitants in eight different localities, with 30% being of foreign origin (either born outside of Sweden or having both parents born abroad).

Greater Malmö is one of Sweden's three officially recognized Metropolitan areas (*storstadsområden*) and since 2005 is defined by the municipality of Malmö and 11 other municipalities in the south-western corner of Scania. At 2008, its population was recorded to be 628,388. The region covers an area of 2,535 square kilometres.



Since the construction of the Öresund bridge, Malmö has undergone a major transformation with impressive architectural developments, attracting new biotech and IT companies, and particularly students through Malmö University College. The city contains many historic buildings and parks, and is also a commercial centre for the western part of Scania. During the last few years a

university college has been established and the city is now trying to focus on education, arts and culture.

Västra Hamnen

The district is recognised as one of the most sustainable districts in Europe. The 175 hectare artificial island of Västra Hamnen was bought by the Municipality of Malmö in 1996 to develop a new eco-district. The area has been developed with an emphasis on aesthetics, ecology, high-quality housing, architectural diversity and urban spaces. It achieves environmental adaptation and social sustainability in a densely built-up area.



Some of the key features of the development include;

- Rainwater is collected and grey water is treated, system of ponds, open channels moss covered roofs.
- Open rain water management and creation of habitats provides for high level of biodiversity.

- Use of a green space increasing rain water infiltration.
- Wind turbines provide 100 per cent of the electricity.
- Solar panels on the roofs provide 20 per cent of the heating with the balance coming from an existing, super-efficient district heating system.
- Recyclable and organic materials are collected to contribute to energy production by the city's biogas plant. The biogas is then used to heat homes and power vehicles.
- The residents are able to monitor their energy consumption on information panels in each home.
- Paths and cycle tracks are a feature of the district.
- The focus has been on the use of resources, human interactions and the aesthetic appeal of the development.
- Private investors developed the district in small packages and were guided in providing quality solutions for the district.



15.3.6 Copenhagen – Denmark

Copenhagen has a current population approximately 550,000 (2012) with a total area of 90sq km. and is subject to rapid population growth. The population of the metropolitan area is currently 2m.

Copenhagen is a major regional centre of culture, business, media, and science, as indicated by several international surveys and rankings. Copenhagen has repeatedly been recognized as one of the cities with the best quality of life. It is also considered one of the world's most environmentally friendly cities.

Overall 68% of citizens commute to work by bicycle, on foot, or by public transport, 36% of all citizens commute to work by bicycle.

There is a strong urban and cultural development influence with large investments in cultural facilities as well as infrastructure. As of 2011, Copenhagen is



ranked as the 17th most expensive city in the world according to the Mercer Cost of Living Survey.

Their planning system is required to be consistent with National Planning Policy. The planning approach includes Regional Spatial Plans, which focuses development around transport nodes.



In response to the increasing population growth the City is involved in a number of large urban renewal/upgrade projects. There are 5 key projects currently underway as a result of large scale infrastructure upgrade projects including areas around Carlsberg, South Harbour, North Harbour and Ørestad.

The new developments will be compelled to use the district heating provided by the city from the waste incineration plant. They are also currently working on options for district cooling, which will use a lot of the existing infrastructure and distribution network.

The city has very tight planning controls on the provision of outdoor space for new developments requiring 40% of the area (will not go below 30%) to be reserved for open space, which does not include roads and car parks.


Copenhagen places a great deal of emphasis on creating open/green space as part of these redevelopment projects. As an example, Ørestad is a developing city area on the island of Amager. It is expected that 20,000 people will live in Ørestad, and 80,000 people will be employed in the area. The area is being developed using the new town concept and will be served by the Copenhagen Metro. The area of the city is approximately 3.1 km², one third of which will be parks and green spaces.

Copenhagen has a very high usage of bicycles for daily commutes, with 1.2 million km's cycled every day as compared with 4.8 million km's driven by car every day.

Municipal Plan Vision

As outlined above planning for the region includes Malmö and a key objective is that Copenhagen should be coherent and sustainable metropolis. Their vision makes reference to being socially well balanced and that they will focus on healthy and green growth.

They also aim to be the first carbon neutral region by 2030. They actively support Copenhagen as a location to study and test state of the art solutions for renewable energy, sustainable urban planning, and sustainable transport. Their vision also refers to the City as being a Business hub.



The implementation of the Municipal Plan is supported by a range of key strategies; **'A Metropolis for the People'** objective to become the world's most liveable city, urban design focus on urban living as the priority and then building design follows. Annual report prepared 'Urban Life Account' based on surveys to check they are achieving objectives.

Open Space

Copenhagen is a green city with many big and small parks and the surrounding areas have 3 beaches with a total of approx. 8 km of sandy beaches within 30 minutes cycling from the city centre. This includes Amager Strandpark, which opened in 2005 and includes a 2 km long artificial island and a total of 4.6 km of beaches located just 15 minutes by bicycle or a few minutes by metro from the city centre. The beaches are supplemented by a system of Harbor Baths along the Copenhagen waterfront.

'Green Mobility Strategy' including Cycling Strategy, Parking Strategy, Walking Strategy. They have supported the implementation of the strategy with a number of initiatives including the provision of an extensive bicycle dedicate network/pedestrian network, separated where possible from road vehicular traffic. Some streets have been closed some streets to cars. Public transport is bicycle friendly, for example a large proportion of train rolling stock has been converted to allow bicycles in passenger compartments. They have also ensured bicycle parking is available at the origin a destination, to ensure interconnection of bicycles and public transport. In fact 54% of bicycle users choose bikes because they are easy, there are also a high percentage of cyclists (19%) that choose bikes as an alternative a form of exercise. Other reasons given for cycling are that it is considered cheap and easy. Provision of bicycle parking at origin/destination is seen as a dominant factor in the success of bicycle use.

Climate Change Adaption Strategy

Copenhagen is relatively low lying and they have started modelling future flood patterns, sea level rises, and storm surge implications. Some of the strategies currently being considered include retrofitting urban storage capacity such as on roadways, underpasses etc as retarding basins.

15.3.7 Rudersdal - Denmark

Rudersdal is a rural municipality with a population of 55,000. The vision for the municipality is for; Rudersdal to be the best place to live. The Council is made up of 23 Councillors, and operates five Boards with 7 Councillors each are in charge of;

- Technology
- Children & School
- Social & Health
- Culture & Nature
- Company & Work

They prepare a Council Plan for every Council cycle of 4 years. At each election a new 12 Council Plan is prepared. They have an ongoing requirement to actively market test maintenance services.

There is a focus on green areas, and a current open space ratio of 880m² of green space per resident.

The municipality has a high proportion of private roads with approximately one third of its 329km of roads in private ownership. The municipality has an extensive bicycle network with 108km on road bike lanes, another 114km (off road) bike lanes, and 115km of recreational routes. Car ownership Rudersdal 2.2/household, compared with 1.8/household Copenhagen, and 1.2/ household in Denmark (compared to 1.54/household in Melbourne).

Rudersdal has joined with 5 other municipalities to build municipal incinerator, the heat generated is used for electricity generation and district heating. Residual waste from the incinerator is recycled and used as road base, metals extracted by magnates.

With increasing population there is an increasing issue with combined sewer/stormwater, particularly during high rainfall events. They have a program of actively trying to encourage owners to disconnect stormwater and deal with it on their site (with approval), housing blocks around 1000m². Denmark relies on groundwater for a high proportion of its water supply. Therefore there is an opportunity with the use of water sensitive urban design techniques to recharge the watertable with the diverted stormwater.

15.3.8 Zurich – Switzerland


Zurich is the largest city in Switzerland. The municipality has a population of approximately 390,000[4] inhabitants projected to increase to 420,000 by 2025. The population of the metropolitan area has a population of nearly 2 million inhabitants.

Zurich is a leading global city and among the world's largest financial centres. According to several surveys from 2006 to 2008, Zurich was named the city with the best quality of life in the world as well as the wealthiest city in Europe.

In a recent public referendum the people of Zurich voted to write into law the quantifiable and fixed deadline of one tonne of CO₂ per person per annum by 2050.

This forces any decision of the executive to support this goal, even if the costs are higher in all dimensions.





They are actively pursuing the optimisation and improvement of their public transportation system, and enlargement of the bicycle-only network.

The Engineering Division includes 4 Departments;

- Mobility & Planning
- Design & Development
- Planning & realisation
- Road & Bridge Maintenance

They place a great deal of emphasis on urban design. The urban design initiatives are driven by infrastructure maintenance/renewal/upgrade projects. The process for any project includes an initial coordination meeting with all of the relevant staff, maintenance, transport, civil design, parks, mobility etc. A brief is prepared and is signed off/approved at a higher level before the project proceeds. The city of Zurich has responsibility for other service authorities and public transport, so there is a much greater opportunity to coordinate the works.


Project time frames are typically 4 - 5 years, which allows the programs to be adjusted according to the infrastructure maintenance/upgrade/renewal needs to coordinate all activities. They use very high quality materials, granite kerbs, granite cobbles and asphalt which has a design life of 150y plus. They argue that the stone materials are reusable, and therefore although there is a high initial cost and high embedded energy in the initial supply, the product is reused and will outlast other products such as concrete. Concrete manufacture has a high embedded energy cost, and they suggest only has a life of around 25y in practical terms (there was no consideration of the potential to crush and recycle concrete).

They report that over the last 15 years there has been a shift in emphasis to a more social focus for infrastructure upgrade projects, hence the greater emphasis on urban design, and creating social value add outcomes. Residents want more from open space, particularly with densification. Zurich had 1 urban designer 10 years ago, and now employs 9 to address this emerging social need.

Some years ago they had all of their parks and key open spaces reviewed by a well known architectural firm. From that they categorised all parks; International/nationwide; regional/for the city; for the borough; for the neighbourhood. They have then defined urban design standards and material standards according to the type of park. Material standards and maintenance standards in a park for the neighbourhood are lower than for an international/nationwide park.

A study was also undertaken in association with the university on the 'Social Value of Parks' which provided a further insight in the design/development guidelines for open space.

They have also defined a palate of typical treatments so that there is a consistency in the themes, and similar elements will appear in both the international and local parks although the degree to which the materials are used may change. They have



prepared a set of urban design guidelines to ensure the consistency of approach, part of the approach involves identifying for instance what the purpose of a road way is, if the road way is designed with a focus for pedestrians and cyclists then the outcome will be different that if the road is designed for cars, and pedestrians and cyclists are secondary. A key goal of the Council at the moment is to provide more cycle paths.

They have identified a significant heat island effect with the city being up to 4C higher than in surrounding areas. They have an active street tree planting strategy, in the city to address this issue. They have undertaken a great deal of research to understand the impact different tree species have on temperature control, and have incorporated that knowledge in to the species planting strategy.

Their asset management systems are well developed for roads, drains, and bridges. They have a very active emphasis on coordination of all activities associated with the design/development/delivery of all phases of infrastructure. A GIS is used to identify the requirements by each respective group for works in a particular location. Therefore with any new project they can refer to the GIS to see what is planned over the next 5-10years in each location.

Sustainability

Zurich has set an ambitious carbon reduction target as a result of a community referendum, 76.4% of respondents agreed to set a carbon reduction target to reduce carbon footprint from around 5tCO₂ per person to 1tCO₂ per person by 2050.

Strategies include Energy Source (water, wind, solar, hydro); Efficiency Technologies (building insulation, electric mobility, and lighting); Sufficiency (mode of transport, living space etc.).

Zurich is in a unique position where they own a Hydro station 150km away, and own wind generation plant in Germany, Norway and Switzerland. In 2010 around 65% of energy needs are met by hydro/other renewable/waste incineration. The balance is supplied by nuclear energy. However the national target is to be nuclear free by 2044. So the city will need to secure other energy sources to make up the deficit.

Program for reduction of energy usage conducted across Council cooperatively with departments. Other initiatives include controls on building development, e.g. energy performance and programs for retrofitting existing houses.

Energy coaching was interesting concept where they have 25 private sector providers (paid) to provide energy coaching to the sector. Zurich has found that consultants are not well educated in terms of what can be achieved. The Coaches provide advice to individual property owners, and/or developers of new projects in terms of what can be achieved in the building design to reduce energy reliance.

They have identified further programs for reducing their carbon footprint to meet the mandated targets these include;

- Secure additional sustainable energy production/supply
- Retrofit existing City owned buildings to improve energy efficiency (10% of total building area)
- Sustainable products as part of a sustainable procurement program
- Enforcement and legal compliance with energy efficiency standards for new & refurbished buildings
- Continue to improve public transport and bicycle networks
- Provide information, motivation, coaching & support to the development industry and private residents to change public behaviour.

15.3.9 Munich – Germany

Munich is a city of 1.35 million people. The population of the metropolitan area is approximately 2.6m.

It is a financial and publishing hub and home to holds the headquarters of Siemens AG (electronics), BMW (car), MAN AG (truck manufacturer, engineering), Linde (gases), Allianz (insurance), Munich Re (re-insurance), and Rohde & Schwarz (electronics).

Munich achieved 7th place in frequently quoted Mercer liveability rankings in 2010.[3] For economic and social innovation, the city was ranked 15th globally out of 289 cities in 2010 and 5th in Germany by the 2thinknow Innovation Cities Index based on analysis of 162 indicators.[4] In 2010, Monocle ranked Munich as the world's most liveable city.




Munich is a green city with numerous parks. The Englischer Garten, close to the city centre and covering an area of 3.7 km² is larger than Central Park in New York.

Overall the population of Germany decreasing, with a current population around 82m projected to decrease to around 70m by 2025. The working population in 2005 of around 42m is projected to decrease to 35m by 2035. Approximately 25% of the population are immigrants. Against this background the population of Munich is increasing, with migration of population from regional areas. Overall there is enough work in Munich to support the growing population. Although with immigration there are some structural problems with different ethnic backgrounds.

The principal sources of income for the city are income tax and company tax. Company tax is variable, depending on the economic climate.

Urban Development

Greatest opportunity for Government sponsored renewal/redevelopment projects for new housing, is associated with infrastructure upgrade programs where transport



reserves such as railways become available or with the downsizing of the armed forces, some land has become surplus. Some investigation has been undertaken into redeveloping areas that were developed in the 50's & 60's. Munich requires several thousand new apartments per year, but is only building on average around 3,500 per year. In terms of urban planning in a referendum held in 2004, the majority view would not support towers greater than 99m, which is the same height as the spires on Frauankirche.

Private development projects are required to provide 30% of low cost housing and/or community services such as kindergartens/libraries etc. Ownership of the low cost housing remains with the developer, and rents are regulated. Developers are required to provide 14m² of open space per person as part of any new development. With such a high migrant population one of the greatest issues for Munich is the provision and integration of low cost social housing.

Most people cannot afford to buy an apartment. The cost of apartments in the centre of Munich is up to 20,000 Euro. per m². The rental market is tightly regulated.

Transport

Three tiers of government, each has a role in public transport, with 3 different levels of trains being operated out of the central railway station Hopfbahnhof, which leads to some complexity in developing public transport upgrade projects.

Bicycles are promoted, although, not as strong utilisation rate as Copenhagen. The City considers that there is a need to invest in further bicycle path infrastructure to promote bicycle use. But public transport patronage rate is very high. In the order of 50% of daily commutes to work are taken by bicycle, pedestrian or public transport.

Liveability attributes

- economic prosperity
- good size population 1.3 - 1.4m
- extensive public transport, tram, train and bus networks
- network of cycle paths for commuting
- good access to medical facilities, schools, recreational and cultural facilities
- small enough that a bicycle is a viable means of transport
- buildings of historical significance
- special physical appearance, boulevards rather than a grid pattern of streets, planning controls have been in place since 1904.
- streets set out so that local streets do not go through.
- large areas of open space, well distributed for easy access by residents
- Close to the mountains and outdoor recreation areas



Germany has ambitious targets for reducing energy consumption, current Federal policy decision to cut the use of nuclear by 100%. There is significant investment in a range of alternative technologies to replace nuclear, including wind, biomass, solar and waste incineration.

Referendums are held periodically, about large public interest issues e.g. infrastructure type projects. They had just had a referendum on building a 3rd runway at the Munich airport, which had been opposed by 54% of the population.

The GFC has had a limited impact on building development in Munich, or in Germany. They have essentially retained full employment, with an unemployment rate of around 4-5%.

15.3.10 Vienna – Austria

Vienna City has a population of 1.7m, with the population and the metropolitan area has a population of 2.6m. Vienna is the capital and largest city of Austria and is also one of the nine states of Austria. The City is host to many major international organizations, including the United Nations and OPEC.

The city was ranked 1st globally for a culture of innovation in 2007 and 2008, and 2nd in 2009 from 256 cities on an analysis of 162 indicators in the Innovation Cities Index on a 3-factor score covering culture, infrastructure and markets.

Urban Development


Vienna regularly hosts urban planning conferences and is often used as a case study by urban planners.

Vienna is both the capital city and a province, as such it has total control over planning, both policy and regulation. More than 50% of their revenue comes from income tax collected federally. Within the province there are 23 districts, none have planning responsibilities. The city is growing outside its boundaries, and the City needs to negotiate with abutting provinces to coordinate ongoing development.



An Urban Development Plan adopted by Council, focuses development along transport corridors. The development is such that there is a need to develop additional transport links to support the ongoing development.

Originally infrastructure for the City was planned for a population of about 2.2m (population in 1910) subsequently the population declined to 1.52m in the year



2000, and has increased to 1.65m in 2012. The population of Vienna will grow to approximately 2m by 2020, mostly by immigration from Eastern Europe which has occurred following the opening of the EU.

The Planning Framework incorporates the following key components;

- Urban Development Masterplan
- Transport Masterplan
- Land use & Building Regulation Plan (regulations for the implementation of the above - which is enforceable at law)

Approximately 85% of housing in Vienna is state subsidised. Housing development provided by the private sector is not required to provide public open space.

Currently 50% of Vienna is open space (35% is buildings and 15% is roads and other). One of the objectives of the Urban Development Masterplan is to retain the ratio of 50% open space, however there is only enough space remaining in Vienna to accommodate a further 8-10 years population growth.

The average building height throughout the City is 20m. They are currently undertaking the redevelopment of some brown field sites (former railway land) in conjunction with Austrian Rail. However there is no long term strategy to accommodate the projected population growth within the city boundaries. As such this will put more pressure on existing green space, and coordinated development outside the province along transport lines.

Transport

The modal split for travel to the city is approximately 2/3rds by public transport, 1/3rd by car. They have a Transport Plan adopted by Council which aims to reduce reliance on car travel. In 2003, 40% of the trips were by car, this has reduced to 28% in 2012, and the target is for 5% by 2020. Cars pose a significant problem for parking particularly in the narrow streets. The strategy for reduction in the use of cars is a push/pull approach, and uses a number of initiatives such as provision of park & ride facilities, car share schemes comprehensive public transport services, bicycle parking at stations (most trains are not equipped for bicycles). The City is actively trying to increase bicycle use, current use for city trips is 6%, and the target is for 10% by 2020. They have recently created a new bicycle coordinators position to promote the use of bikes.

Sustainability

The carbon emissions per head are currently 5.3tonne p.a. with 2/3rd of emissions from energy supply and transport. They have had a very successful sustainability strategy in place for a number of years which has recently been revised (KlipII). The strategy is based around 5 themes;

- Energy supply
- Energy use
- Procurement & Waste Management
- Public Relations

- Mobility & Urban Structure

The City is currently investing in alternate energy sources, predominantly wind, solar, and biogas. With a mix of sources for security (Austria is a nuclear free country). They have also invested in subsidising solar installations on housing, and retrofitting buildings to make them more energy efficient. They estimate that approximately 25% of buildings have been retrofitted. Part of the approach is to change the social attitude to roads, so that pedestrians and bicycles play a much greater part of the modal transport system. The Sustainability Department reports directly to the CEO, and is not the portfolio responsibility of a Councillor.

There have been large budget cuts across the organisation with more money directed towards social services. They are currently reviewing road construction/maintenance standards with a view to saving money in this area.

The unemployment rate was 7.4% in 2010 and they are aiming for an unemployment rate 3.5% which for them is full employment.

MVA Pfaffenau

The waste incineration plant in Pfaffenau, Vienna, fully operational since September 2008, receives 250,000 t of residual waste per year. The thermal recycling of the valuable raw material waste provides approx. 50,000 households with district heating as well as approx. 25,000 households with electricity.

Daily up to 200 refuse vehicles unload their contents into the feed hopper of both combustion grates. A total of 32 tons of residual waste is burned per hour at a minimum temperature of 850 degrees.

In the heat recovery boiler, the flue gas is used to generate steam. This steam, at high pressure and a temperature of 400 degrees Celsius, drives a steam turbine to generate electricity. The remaining steam, after the turbine, is used for long-distance heating via heat exchangers, which is routed into the district-heating network. A total of 76% of the energy contained in the waste can be used effectively. The plant obtains very low emission levels which are emitted into the atmosphere.



Non-combustible residual materials such as slag, ash, scrap and stones remain at the end of the combustion grate. The scrap is fed back into the materials cycle in the steel industry. The slag released from metals and the ash are processed to concrete at the city's own waste treatment plant and deposited in landfill.

Biogas

Biogenic waste, e.g. leftovers, expired food, market waste and other organic waste is utilised at the biogas plant. The waste undergoes wet treatment processing and the resulting waste suspension is brought to fermentation. During fermentation, microorganisms degrade the contents of the waste suspension. This forms biogas, a valuable energy carrier containing an average of 58.8% methane (natural gas) and used for the production of district heating.

The current plant takes an input of 17,000 t and produces a total of 1.7 million m³ of biogas per annum. The utilisation of biogas has produced 5,270 MWh of district heating, which meets the heating needs of the plant, and a further 510 households in Vienna.





15.4 Liveability Criteria

The following criteria are measures used to assess liveability of the various cities as discussed in Section 5 of this report.

Stability

- Prevalence of petty crime
- Prevalence of violent crime
- Threat of military conflict
- Threat of civil unrest/conflict
- Threat of terrorism

Healthcare

- Availability of private healthcare
- Quality of private healthcare provision
- Availability of public healthcare
- Quality of public healthcare provision
- Availability of over the counter drugs
- General healthcare indicators

Culture & Environment

- Climate: Humidity/Temperature rating
- Climate: Discomfort to travellers
- Cultural hardship: Corruption

Cultural hardship: Social/Religious restrictions

- Cultural hardship: Level of censorship
- Recreation: Sports
- Recreation: Culture
- Recreation: Food and drink
- Availability of consumer goods and services

Education

- Availability of private education
- Quality of private education provision
- General public education indicators

Infrastructure

- Transport: Quality of road network
- Transport: Quality of public transport
- Transport: Quality of regional or international links
- Availability of good quality housing
- Utilities: Quality of energy provision
- Utilities: Quality of water provision
- Utilities: Quality of telecommunications infrastructure

15.5 City - Liveability/European Green City Index Comparison

	Copenhagen (Denmark)	Helsinki (Finland)	Malmö (Sweden)	Melbourne (Australia)	Munich (Germany)	Stockholm (Sweden)	Vienna (Austria)	Zurich (Switzerland)
European Green City Index	1 (Score 87.31)	7 (Score 79.29)		n/a	n/a	2 (Score 86.65)	4 (Score 83.34)	6 (Score 82.31)
EIU Most Liveable City Ranking 2011	Not in top 10	7	Not in top 10	1	Not in top 10	Not in top 10	2	Not in top 10
Monocle Most Liveable City Ranking	3	1		5	4	Not in top 10	6	2
Mercer Quality of Living Survey 2011	9	Not in top 10		Not in top 10	4	Not in top 10	1	2
Population City Centre Population 000's	504 (2007)	570 (2007)		97	1,387	795 (2007)	1,670 (2007)	377 (2007)
Population Greater Metropolitan area 000's	1,200	1,350		4,000	5,480	2,000	3,540	2,000
Green space m² per person	49	134		46	35	108	120	-
CO2 tonnes/head	5.38 (2007)	6.01 (2007)			7.28 (2006)	3.62 (2007)	5.19 (2007)	3.7 (2007)
Percentage of domestic waste recycled	23.61 % (2007)	57.61% (2007)		-	43 % (2008)	31% (2007)	33.35% (2007)	34% (2007)
Total percentage of citizens walking, cycling or taking public transport to work	68%	54.7%			58.6%	93%	68%	62%
Water Consumption litres/per person/day	403 (2007)	209 (2007)		277 (2007)	172 (2007)	509 (2007)	218 (2007)	315 (2007)

15.6 National Advanced STEP Framework

The following elements and levels of service criteria are used in the assessment of compliance with the National Framework referred to in Section 10 of this report.

Financial Planning and Reporting + Asset Planning and Management

1. Strategic Long-Term Plan
2. Annual Budget
3. Annual Report
4. Asset Management Policy
5. Asset Management Strategy
6. Asset Management Plans
7. Governance and Management
8. Levels of Service
9. Data and Systems
10. Skills and Processes
11. Evaluation

	Levels of Service
Core	Council has Service Plans for each of its services which have been developed in consultation with the community.
Core	Council has undertaken the process of defining, quantifying and documenting current community levels of service and technical levels of service, and costs of providing the current levels of service.
Core	Current and target levels of service (for both community levels of service and associated technical levels of service) are clearly defined in each Asset Management Plan.
Core	Technical levels of service are incorporated into service agreements and/or maintenance, operational and capital renewal procedures.
Advanced	Council has undertaken the process of identifying the costs associated with each level of service, including the increased cost or decreased cost associated with increasing or decreasing each level of service respectively to assist in scenario modelling.
Advanced	Target community levels of service are defined through community consultation, considering population and demographic change projections, trend analysis and customer feedback and requests.
Advanced	Council has a communication plan to communicate information on infrastructure service delivery issues and Councils management of these issues to external stakeholders,
Advanced	The cost of maintenance and operational activities are reported against adopted levels of service.
Advanced	Council, in conjunction with the community, regularly reviews its community levels of service and technical levels of service, to determine the financial impact of a change in service levels. If a change occurs this is then reflected into the Asset Management Plan and Long Term Financial Plan.



15.7 Levels of Service – Detailed Criteria

The following are the detailed criteria used to assess compliance with the National Framework referred to in Section 10 of this report

NAMAF Key Assessment Criteria

Strategic Planning

- Alignment to be achieved between Strategic Long Term Plan (SLTP), Long Term Financial Plan (5yr) (LTFP) and Asset Management Plan (AMP)

Annual Budget

- Annual Budget prepared based on the resource requirements and strategic objectives detailed in Councils Strategic Long Term Plan, Asset Management Plans and Long Term Financial Plan.

Annual Report

- Evidence required that the Annual Report aligns with Council's Strategic Long term Plan.

Asset Management Policy

- Asset management Policy to be revised to incorporate Council's vision and service delivery objectives for Asset management
- Direct linkage of AM policy to SLTP & LTFP.
- AMP's to be adopted by Council, informed by community consultation.
- Policy to define AM roles, responsibilities, reporting framework, and training needs.

Asset Management Strategy


- AM Strategy to be prepared and adopted by Council. Strategy to link service delivery needs of community, SLTP and LTFP, and annual budget.
- AMS to set out AM management practice, actions to implement AM policy, including resource requirements, timeframes and accountabilities

AM Plans

- Documented AM Plans for all material asset groups – to Appendix A of International Infrastructure Management Manual.
- AMP's to link to AM policy and SLTP & LTFP
- AMP's have been prepared in association with community consultation.

Governance Structure

- Governance Structure in place to ensure
 - High level oversight by Council, EMT of development & implementation of AMP's
 - Roles and responsibilities clearly defined
- Council has documented process for making investment decisions in accordance with SLTP, LTFP, Council Plan and details costs on operating & maintenance budgets and risk management assessments.
- Cross functional Asset management Steering Committee established



Levels of Service

- Council has service plans for each of its services developed in consultation with the community.
- Community levels of service and technical levels of service to be incorporated into AMP's.
- Technical levels of service to be incorporated into service agreements and/or maintenance, operational and capital renewal procedures.

Data and Systems

- Council has consolidated, integrated complete and up to date, asset register with appropriate security that includes all information about each asset group
- Common corporate data framework for all asset classes
- Procedures in place to undertake regular asset condition surveys
- Systems can produce maintenance and renewal programs, and cash flow forecasts

Skills and Processes

- Council has processes and skills to collect and record asset data, review and update Asset Management Plans, Strategies, and Policy on a periodic cycle
- Council has the necessary skills, processes and resources to undertake all asset management activities including; asset risk assessments; financial reporting; periodic review of Asset Management Plans, Strategies, and Policy

Evaluation

- Processes are in place for regular reporting to EMT, and Council regarding asset management, including the monitoring and reporting on the performance against technical levels of service, and community levels of service.

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