



**Municipal  
Engineering  
Foundation Victoria**



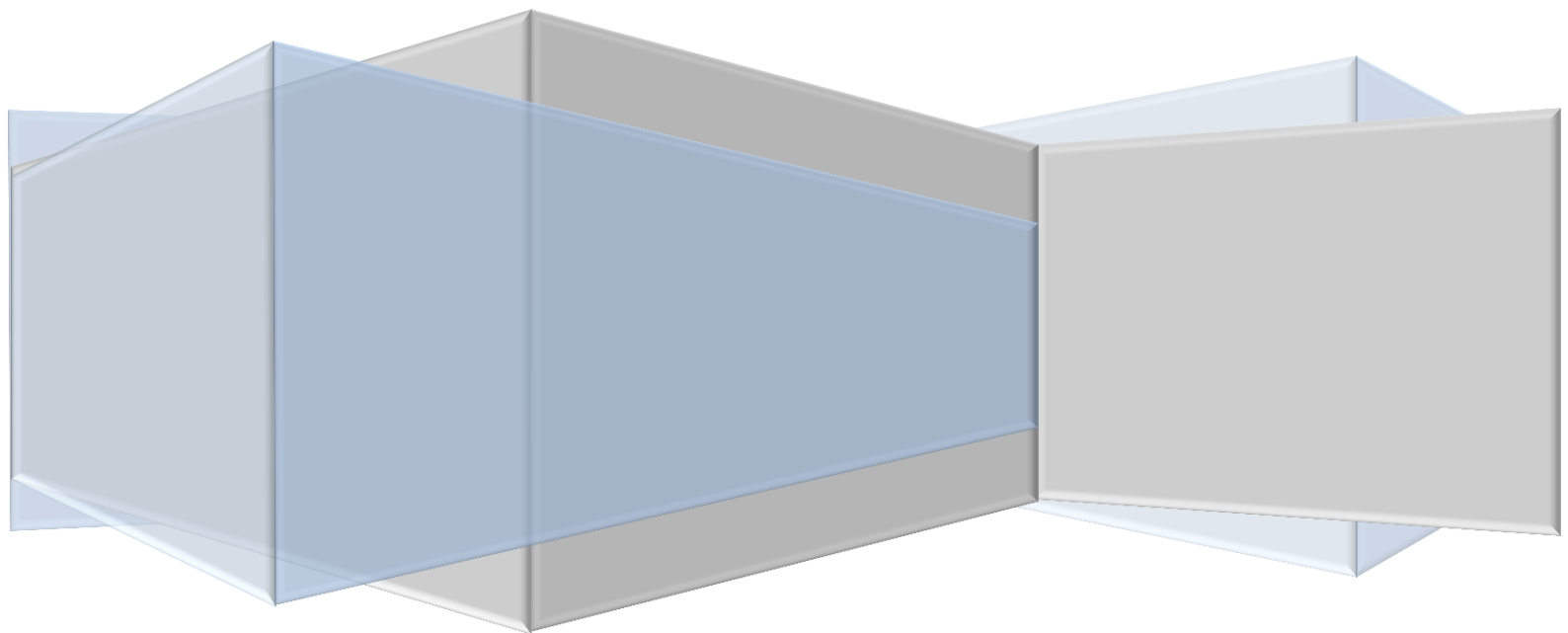
**COMMITTED TO A  
SUSTAINABLE  
PENINSULA**

# **Innovations in Public Works Engineering**

**An International Perspective**

**Alison Leighton**

**Mornington Peninsula Shire**



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*“Once you have traveled, the voyage never ends, but is played out over and over again in the quietest chambers.*

*The mind can never break off from the journey.”*

**Pat Conroy**

**New York Times Best Selling Author**

## 1. Forward

In August, 2014, the Municipal Engineering Foundation of Victoria (MEFVic) sponsored five Victorian local government engineers via a financial scholarship to participate in an international study tour in the United States, Canada and the United Kingdom. The Study tour involved visits to fourteen different public works organisations and attendance at the American Public Works Congress in Toronto, Canada.

Each of the scholarship recipients had specific study topics of focus which ranged from coastal climate change adaptation to sustainable transport to success in project management and innovations in the delivery of public works.

The tour, which was led by Mr Claudio Cullino, MEFVic Trustee, was undertaken over a period of approximately four weeks and included visits to San Francisco, Miami, New York, Toronto and London.

This report summarises the key findings of the tour with respect to innovations in the public works sector – my selected topic of study.



*From L to R: Rick Kwasek, Alison Leighton, Ebony Perrin, Daniel Przychodzki, Claudio Cullino (MEFVic Trustee) and Chris Hastie at Miami Beach, Florida.*

## 2. Acknowledgements

I would like to sincerely acknowledge the support of MEFVic who have been providing the opportunity for local government engineers to enhance their skills through scholarships for almost fifty years. I am incredibly grateful for the opportunity that I was given and for the experience and knowledge that I gained on the study tour. In particular, the relationships that I have formed with the trustees of the foundation, my fellow study tour participants and international municipal contacts, are, and will continue to be, of great importance in my success as a local government engineer and leader.

I would also like to thank and acknowledge the support of the Mornington Peninsula Shire Council and in particular, that of my former Director, Sustainable Infrastructure, Alex Atkins. I was encouraged to apply for the scholarship and participate in the tour by Alex and the value I obtained through the tour was certainly maximised by the many conversations we had about the engineering in the international context.

My fellow study tour participants (Chris Hastie, Ebony Perrin, Rick Kwasek and Daniel Przychodzki) served as excellent travel companions and I thoroughly enjoyed their company and support throughout the four week period. The many conversations we enjoyed about our respective organisations and internal processes and approaches also served as a valuable learning opportunity. I am also very grateful to the trustee present on the tour, Mr Claudio Cullino for his care, patience and guidance during the tour.

Finally, I would like to thank my family, who encourage me everyday towards success and satisfaction, even if that means being away from them for an extended period of time. Thank you to Daniel and Wesley for your endless encouragement and support.



### 3. Introduction

The 2014 Municipal Engineering Foundation Victoria Overseas Study Tour involved five Australian Local Government Engineers, from the State of Victoria, travelling as a group to meet with and learn from Local Authorities and related organisations in the United States, Canada and the United Kingdom. The table below identifies the organisations that agreed to be involved in the tour.

Each participant on the study tour had a specific topic of focus ranging from Adaption and Mitigation Strategies for Climate Change, Coastal Management Strategies, Asset Management, Lifecycle Management, Public Works Service Delivery and Project Management.

The focus of this report is to outline the findings of the study tour with respect to 'Innovations in Public Works Engineering

In particular, the report focuses on:

- Design of infrastructure works programs and projects.
- Existing infrastructure project/program evaluation methodologies.
- Assessment and communication of the broader economic and community benefits of project delivery.
- Successful funding models used in international municipalities to expand and optimise infrastructure budgets.

#### Summary of Site Visits

City	Organisation	Description
<b>San Francisco, California, USA</b>	San Francisco Public Utilities Commission	The San Francisco Public Utilities Commission (SFPUC) is a public agency of the City and County of San Francisco that provides water, wastewater, and electric power services to the city and an additional 1.6 million customers within three San Francisco Bay Area counties. <ul style="list-style-type: none"> <li>- Approximately 2,800 employees</li> <li>- Annual Budget: \$816.5M USD</li> </ul>
	County of San Mateo	San Mateo County is located in the U.S. state of California. As of the 2010 census, the population was 718,451. San Mateo County is part of the San Francisco Bay Area. It covers most of the San Francisco Peninsula. San Francisco International Airport is located at the northern end of the county, and Silicon Valley begins at the southern end. The county's built-up areas are mostly suburban with some areas being very urban, and are home to several corporate campuses. <ul style="list-style-type: none"> <li>- Budget: \$200M</li> <li>- Employees: Approximately 300</li> </ul>
	Alameda County Public Works Agency	Alameda County Public Works Agency is located within the San Francisco Bay Area. The agency offers many programs and services to the public including: Traffic/Safety, Building/Permitting, Flood

City	Organisation	Description
		Control, and Community Services. <ul style="list-style-type: none"> <li>- \$216M total budget</li> <li>- 1,578,900 population</li> <li>- 1,914 square kilometres</li> </ul>
	San Francisco Municipal Transport Authority	The San Francisco Municipal Transportation Agency (also known as SFMTA or San Francisco MTA) is an agency created by consolidation of the San Francisco Municipal Railway (Muni), the Department of Parking and Traffic (DPT), and the Taxicab Commission. Employees: 4,800 Operating Budget: \$816M Capital Budget: \$525M
Miami, Florida, USA	Miami Dade County	Miami-Dade County is located in the southeastern part of the State of Florida. As of the 2010 census, the county had a population of 2,496,435, making it the most populous county in Florida and the seventh-most populous county in the United States. It is also Florida's third-largest county in terms of land area, with 1,946 square miles (5,040 km <sup>2</sup> ). Employees: 25,000 employees Total Budget: \$6,194,140,000 Capital component: \$1,649,000,000
	City of Miami Beach	Miami Beach is a coastal resort city in Miami-Dade County, Florida, United States. The municipality is located on a series of natural and man-made barrier islands between the Atlantic Ocean and Biscayne Bay, the latter of which separates the Beach from Miami city proper. As of the 2010 census, Miami Beach had a total population of 87,779. Total Operational Budget: \$501,924,000 Total Capital Budget: \$1.2B Total land: 48.5 square kilometres
New York City, New York, USA	City of Newark, New York	Newark is the largest city (by population) in the U.S. state of New Jersey. Located in the heart of New Jersey's Gateway Region, it is the second largest city in the New York metropolitan area, approximately 8 miles (13 km) west of Manhattan. One of the nation's major air, shipping, and rail hubs, the city has a population of 277,140. Total Land: 68 square kilometres
	New York City Department of Transport	There are over 4,500 employees at the New York City Department of Transportation. This agency oversees an annual operating budget of \$900 million and a five-year \$6.3 billion capital program, 6,000 miles of streets and highways, over 12,000 miles of sidewalk, 789 bridge and tunnels. DOT's staff installs and maintains over one million street signs, 12,700 signalized intersections, over 315,000 street lights, and 69 million linear feet of markings.
	New York City Department of Environment	The New York City Department of Environmental Protection (DEP) has more than 6,000 employees and is the department of the government of New York City <sup>[1]</sup>

City	Organisation	Description
	Protection	that manages the city's water supply, providing more than 1.1 billion US gallons (4,200,000 m <sup>3</sup> ) of water each day to more than 9 million residents (including 8 million in the City of New York) through a complex network of nineteen reservoirs, three controlled lakes and 6,000 miles (9,700 km) of water mains, tunnels and aqueducts. DEP is also responsible for managing the city's combined sewer system, which carries both storm water runoff and sanitary waste, and fourteen wastewater treatment plants located throughout the city.
Toronto, Ontario, Canada	Halton Region	Halton Region is made up of 4 Local Municipalities (The City of Burlington, The Town of Halton Hills, The Town of Milton and the Town of Oakville. Halton Region covers over 232,000 acres of land (967 square km), including a 25-km frontage onto Lake Ontario. The approximate population of Halton Region is 470,000 and the total value of the Halton Region's assets is \$2.7B
	City of Burlington	The City of Burlington is located in Southern Ontario on the north shore of Lake Ontario between Hamilton and Toronto at the west end of the Greater Toronto area. The city is a growing municipality with a population of approximately 165,000. The City of Burlington has a total land area of 187 square kilometres and a total capital budget of \$68M.
	Thales	Thales Group is a French multinational company that designs and builds electrical systems and provides services for the aerospace, defence, transportation and security markets. The Thales group has a key office in Toronto, Canada.
	APWA Congress	The American Public Works Association Congress is an annual conference and exposition which sees more than 4,000 public works professionals attend education sessions, demonstrations and presentation on the latest innovations in public works. The 2014 Congress was held in Toronto, Canada.
London, England	City of London	The City of London provides local government and policing services for the financial and commercial heart of Britain, known as the 'Square Mile'. It is a city and ceremonial county within the broader metropolis of London. It is known as the Square Mile as it is only 1.12 sq miles in area. The City has a resident population of about 7,000 (2011) but over 300,000 people commute to and work there, mainly in the financial services sector.
	Swindon Borough Council	The Borough of Swindon is a local government authority in South West England. It is centered on the town of Swindon and forms part of the ceremonial county of Wiltshire. The Borough has a population of approximately 210,000 and an area of 230 square kilometres.

## 4. Study Tour Findings

Overall, the study tour showed that on almost all measures, local government engineering in Victoria is generally of a quality and standard beyond that seen in the United States, Canada and the United Kingdom. This trend was observed in the sophistication of asset management systems, the approach to community engagement and consultation, reporting and evaluating on infrastructure programs and the observable quality of infrastructure and services provided to those communities.

However, there was certainly a range of innovations and best practice examples seen during the tour visits and spoken of at the APWA Congress that could be applied to the Australian and Victorian context. In considering examples of innovation in the international context, five key themes emerged:

- i. Engineering Agility
- ii. Organisational Alignment
- iii. Leveraging Funding Opportunities
- iv. Evaluation
- v. Public Works Leadership

A summary has been provided of each of these themes with specific case studies and references for further information included as part of the discussion.

### 4.1 Engineering Agility

In 2014, the need for agile and nimble municipal engineering has never been greater. Financial resources are constrained and the community's expectations of public infrastructure and public spaces are higher than ever. Municipal engineers are under increasing pressure from elected representatives to deliver outcomes in the public realm that go beyond the traditional road related infrastructure asset types. The study tour demonstrated that there is an emerging shift towards **place-based planning** and delivery, **pilots and trials**, temporary infrastructure and low-cost solutions. The '**re-tooling**' of programs and resources to ensure that the things are done in the right time, quality and price was seen in almost all of the cities visited on the tour.

The concept of '**Complete Streets**' was first introduced to the Study Tour participants in San Francisco. It is a 'step change' in managing road related infrastructure within a precinct and considers the delivery of **integrated works** and the role public infrastructure serves individuals and communities in a broader sense.

San Francisco Municipal Transport Agency (SFMTA) highlighted the need to be nimble, to focus on deliverability and to leverage the value of pilots and trials to establish early successes with community members and elected representatives. This agency considers the '**low touches**' and 'quick fixes' that can move their organisation from the planning/strategy phase to the delivery phase in a timely and evidential manner.



At SFMTA 'Complete Streets' includes integrated planning of works so that when a street is 'touched' everything else is considered. For example, the paving rehabilitation program in San Francisco drives the timing of other infrastructure programs, such as line marking, street tree planting and the installation of cycling-related infrastructure. A five year planning horizon is used and a culture of taking advantage of opportunities is encouraged. The SFMTA aim to embed complete streets into the way they 'do business'. Over time it is hoped that this concept becomes the standard approach to planning and delivering the full gamut of their public works programs.

The Folsom Complete Street Pilot Project is one such example whereby SFMTA trialled a pilot safety enhancement project on Folsom Street, between 4<sup>th</sup> and 11<sup>th</sup> Streets, San Francisco. The objective of this project was to increase bicycle and pedestrian safety and comfort by creating a buffered bicycle lane and reducing pedestrian crossing distances. The project also involved a reduction in travel and parking lanes from four to three and as a result was accompanied by significant levels of concerns from a section of project stakeholders. The pilot enabled SFMTA to demonstrate to those who held concerns about the feasibility and/or value of the project that the consumption of one lane of traffic and associated parking did not result in severe congestion but rather improved the amenity of the street. One of the key strategies used by SFMTA in addressing the concerns community members had about losing car spaces was that of 'mitigation'. For example, in the Folsom Complete Street Pilot Project residents were provided with a parking permit to enable them to receive exemptions to the time limited parking spaces established as part of the project. Additional car spaces were also provided within the surrounding streets to offset the loss of those spaces originally found within Folsom Street. This was achieved through reconfiguring parallel parking into angled parking. The 'pilot' approach provided SFMTA with the opportunity to respond to issues as they arose during the trial.



*Folosom Complete Street Pilot Project*



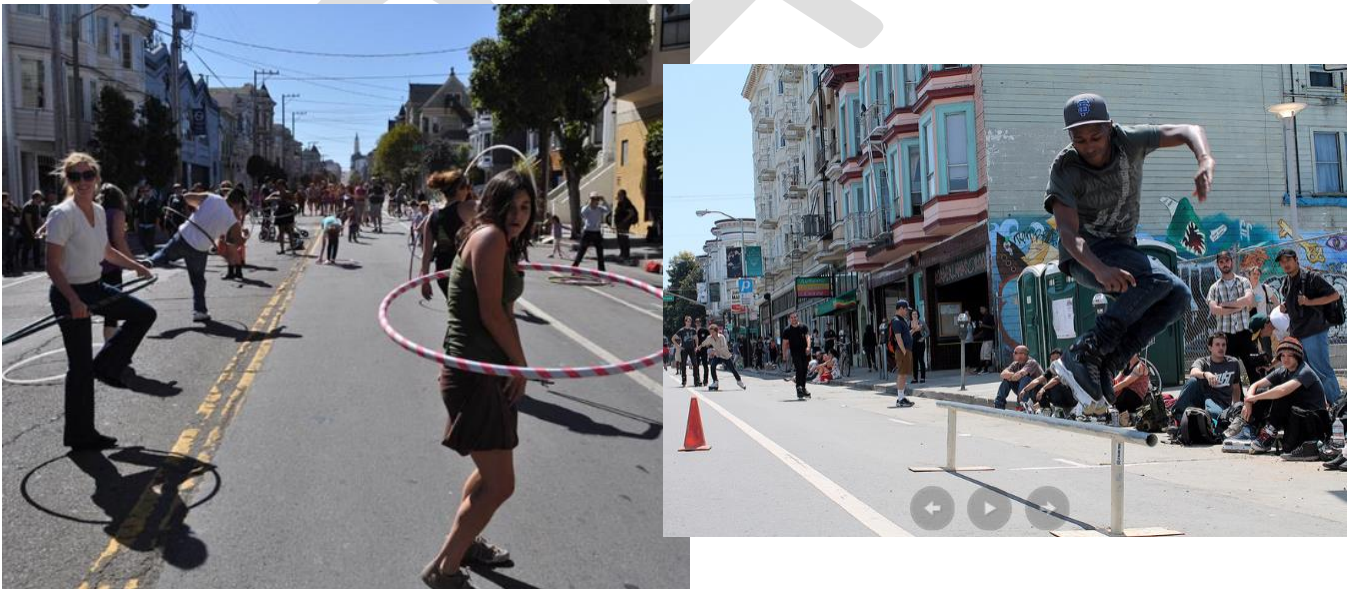
Other examples of SFMTA's focus on 'pilots and

- The installation of a bike barometer on Market Street to count cycling trips
- 'Sunday Street Season' during the warmer months of the year to create temporary open space for the community. Since its founding in 2008, San Francisco's Sunday Streets has successfully created temporary open space for more than one million participants to safely walk, bike and play in different communities across the city. There are now more than 100 Open Streets

programs in the United States and many more cities are looking to adopt this type of program as the Open Streets phenomena continues to gain popularity across the globe.



*Bike Barometer on Market Street (above) and Sunday Streets (below), San Francisco*



The notion of alignment via 'Complete Streets' or 'Liveable Streets' was also seen at the City of New York Department of Transport whereby a precinct approach was adopted in delivering infrastructure enhancement. Here, there was a focus on 'commercial corridors' with the need to work very closely with 'Community Boards' to bring about overall enhancements to the road environment. In delivering these outcomes substantial time was spent on 'managing the politics' and part of this process was the utilisation (and strategic communication) of data and relevant research to 'bring the community along on the journey'. This included the need to undertake origin destination and mode

of travel surveys to establish a clear understanding of existing circumstances prior to making any of the proposed changes.

The types of projects that have been delivered by the City of New York Department of Transport under the 'Complete Streets' program include establishing kerb outstands via pavement painting, spiked in kerbs and planter boxes, increasing space available within the road reserve to cyclists and providing passive opportunities to utilise the road reserve environment through redefining spaces, removing travel lanes and installing pop up street furniture. In implementing these programs, there has been a deliberate focus on selecting simple, low-cost, **non-capital intensive solutions** to deliver the outcomes being sought. Representatives from this organisation spoke of the need to focus on '**low hanging fruit**', to identify those initiatives that could be delivered quickly and at low cost and to be nimble and agile in designing and delivering works. As part of this work the City of New York select temporary measures in the first instance to allow evaluation of success and to provide for the opportunity to modify the design prior to more permanent infrastructure being established.

The New York City Department of Transport have also recently refocused their project delivery model to centre on more agile, social based outcomes rather than infrastructure or asset specific results. This organisation has actively transitioned towards place based considerations and the notion of '**ownership of streets**'. They have started to place less emphasis on asset condition to accommodate increased weighting towards the social-based outcomes they are seeking to achieve. This is not to say that asset condition is less important in the decision making model, but rather that it is only one consideration of many, in determining infrastructure priorities and programs of works.

Some examples of the work recently delivered by the New York City Department of Transport can be seen in the photos and images below. The Ninth Ave project is an award winning example.

*New York City, 'Temporary Seasonal Greening'*



# Pedestrian Crossing Improvements



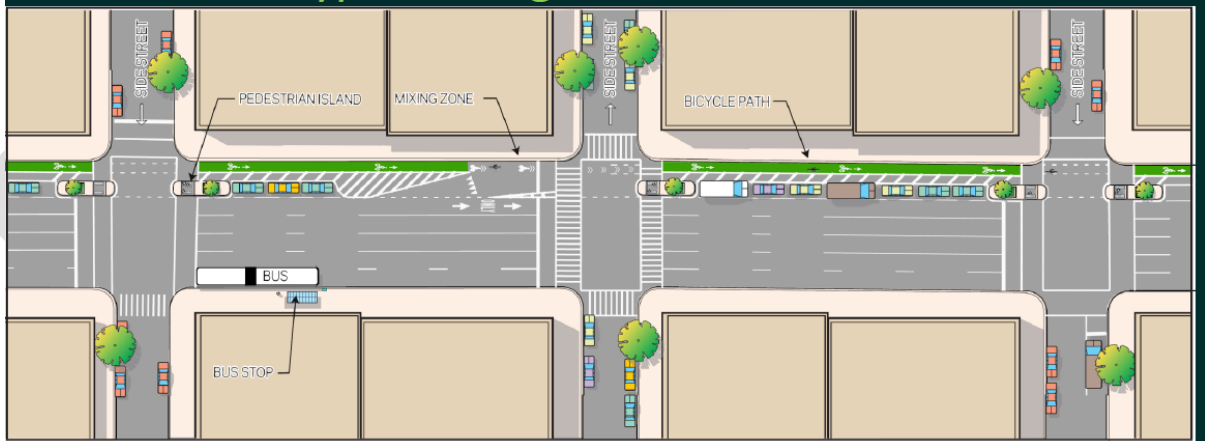
Safe, Protected  
Space on Street



Warning Strips for  
Vision-impaired  
Pedestrians



## Typical Design – Ninth Avenue



Ninth Ave is an award winning complete streets project delivered by the City of New York. Further information is available via: <http://nacto.org/cities-for-cycling/projects/ninth-avenue-complete-street-new-york-city/>

There are many similarities in this approach with that being taken by the City of Toronto, Canada, who's Chief Planner, Jennifer Keesmat, spoke at the American Public Works Association Conference. The City of Toronto are actively transitioning to an approach where they begin their project/program planning from the perspective of places. Part of this approach is asking the questions 'How does this project benefit people?' and 'What shared interests exist amongst the wide range of stakeholders using this place?' The City of Toronto attempts to plan and design their work from a **multi-functional** rather than singular approach and are treating their city as a '**Living Laboratory**', taking a more agile, place-based approach to infrastructure development and being nimble in their delivery of place-based enhancements.

*John Street Pedestrian Initiative Trial, Toronto, Canada*



The City of London also take a place-based approach to the delivery of their works programs and this is emphasised via their commitment to 'managing the spaces between the buildings to enliven the city'. The City of London speak of their twenty year program to improve streetscapes and of their long history of deterring vehicles from using city streets. One this city's biggest challenges is the constrained space they have to work within due to the age of the city. They have limited public space within the road environment and therefore minimal opportunity to make physical

improvements. However, in response to these challenges, they have adopted alternative approaches of response. For example, to accommodate ever-increasing volumes of cyclists on London streets, they cannot 'create' additional bicycle lanes, so rather, their focus is on establishing a 'culture' of respectful cycling behaviour.

Alameda County Public Works Agency demonstrated engineering agility by managing their service levels to accommodate their overall priorities. They have adjusted their service levels down in certain services in order to increase their service levels in others. Alameda County Public Works Agency have also adopted a 'Complete Streets Policy' to guide their approach available at: <http://www.acgov.org/pwa/documents/Complete-Streets-Policy.pdf>

## 4.2 Organisation Alignment

In many ways, municipal engineering projects are becoming more complex and multi-faceted. In order that the value of any project or program is maximised there must be adequate input and participating from a wide range of internal and external stakeholders. Aligning an organisation to deliver on these outcomes in efficient and effective ways is critical and the processes established to manage projects and information is now a fundamental component of success.

San Francisco Public Utilities Commission (SFPUC) demonstrated that an **implementation plan** is a critical component to aligning an organisation for successful delivery of large, multi-million dollar works programs such as their Water Supply Improvement Program. The SFPUC plan has been refined significantly since its initial development and includes key procedures for ensuring transparency, communication and risk management and to provide both quality assurance and quality control. As part of the planning and design phase of each project there are five mandatory reviews that must take place as follows:

1. Technical Peer Review
2. Independent Technical Review
3. Cost Estimate Review
4. Constructability Review
5. Steering Committee Review

The plan also includes three additional optional reviews that are able to be included if the project is highly complex or in the event of other extenuating circumstances. These are:

1. Technical Advisory Review
2. Value Engineering Review
3. Project Management Review

**Change management** is also a key part of the implementation plan with clear definitions of change provided and the use of an 'approval ladder' to ensure that the right authority level is exercising change control and that risks, trends and change orders are tracked against contingencies during construction.

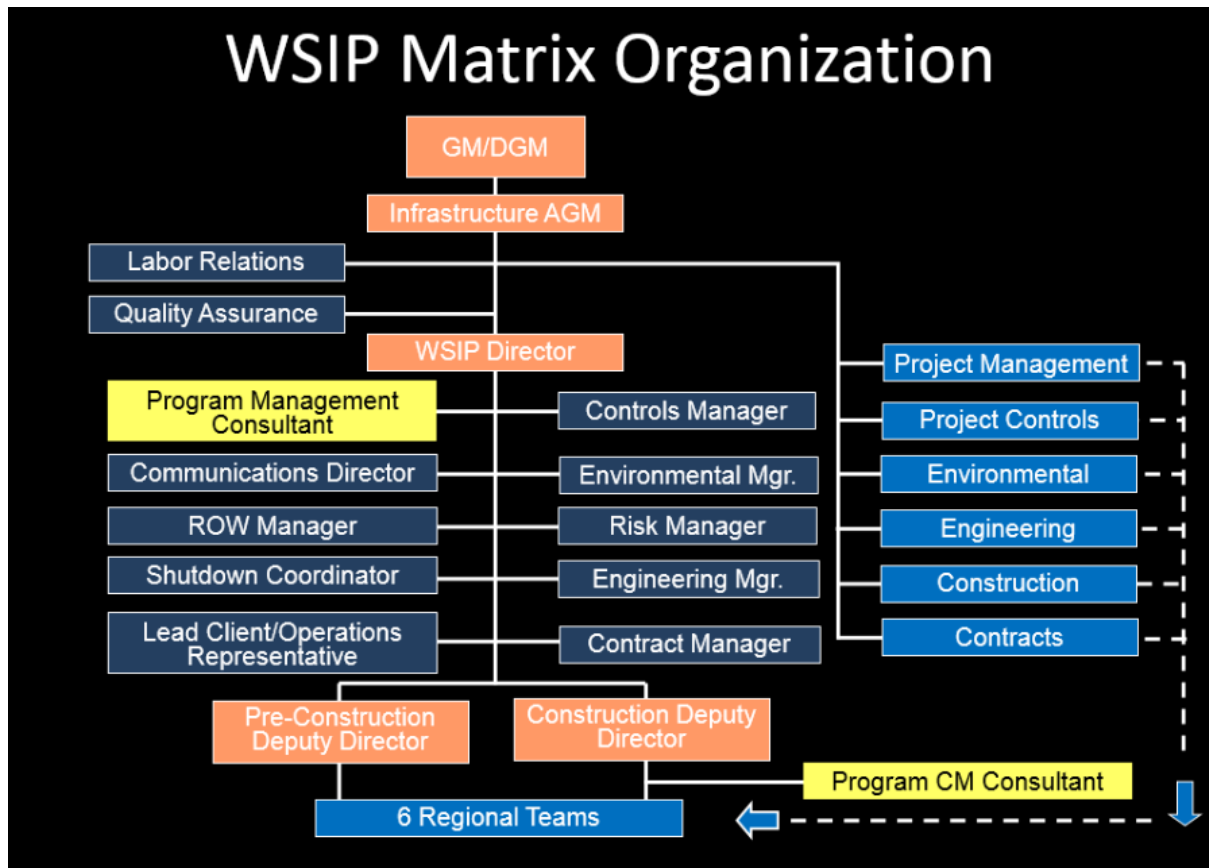
The SFPUC attribute the successful delivery of their \$4.8B Water Supply Improvement Program (WSIP) which involved the delivery of 82 individual projects, to five key elements:

- a. Clearly defined and accepted service level goals
- b. Thoughtful implementation strategies
- c. Strong and diversified staff
- d. Strategic integration of consultants
- e. Trust of stakeholders.

*Calaveras Dam Replacement, Water Supply Improvement Project, SFPUC*



SFPUC employed a project driven organisational structure to bring about greater alignment and accountability and to ensure optimum clarity around roles, responsibilities and authority. The figure below shows the matrix organisation structure that SFPUC established for the WSIP). Consultants who were engaged as part of the WSIP were required to work at the same physical location as SPUC staff their performance was judged via the same key performance indicators. These actions were specific in the relevant contract documents and resulted in strong alignment between all parties involved in implementation of the WSIP.



Alameda County San Francisco, also have an 'Implementation Manual for the Capital Improvement Program' and the New York City Department of Transport also stressed the need to have a clear, concise Implementation Plan for delivering Public Works programs that sat above any specific Project Plan.

City of Newark also advised that a strong emphasis of their leadership group is on breaking down silos and **establishing alignment** within their organisation. This is achieved in practice through the organisation investing time and resources into establishing and maintaining links within and across teams to communicate priorities, monitor progress and celebrate successes. A focus on progressive wins has been established. In addition, there is a 'Total Business Case' requirement for all new projects. This includes a requirement to complete a multi-factorial assessment and life cycle costing taking into account both capital and operational costs. This assessment involves representatives from numerous departments within the organisation and therefore facilitates collaborative decision making, alignment and shared ownership of projects and initiatives.

The site visit to Thales, the only private sector organisation included on the study tour, provided the opportunity to review how one global private entity approaches the take of complex project management and capital program oversight. This organisation uses a consistent project/program delivery process which consists of a range of decision gates or holds points as well as project/program milestones. Key phases have been established which are overseen by a project



management office and the progress of projects is reviewed by a bi-monthly technical review. Sophisticated project Management software is also used to ensure that all decisions and progress associated with the program/project delivery is monitored and controlled and that all stakeholders who require access to project information are able to access it easily and efficiently.

### 4.3 Leveraging Funding Opportunities

The use of **Special Assessment Districts** to deliver higher levels of service was noted in many of the municipalities visited during the tour. The charge is applied to the property and is similar to the Special Charge Scheme Provisions in the Victorian Local Government Act (1989).

Miami Dade County and Alameda County highlighted their use of special charge districts or special assessments for the provision of **higher levels of service**. To establish such a mechanism a minimum of 50% support is required from the beneficiaries before the proposition can be put to the board for approval. Oftentimes it is residents who initiate the assessment to secure higher levels of service in aspects such as lighting or landscaping.

A highly successful example of the use of the special assessment instrument is the Newark Downtown District (NDD), Newark's special improvement district of the central business area. This is a non-profit organization, dedicated to revitalizing downtown Newark by improving the economic viability of the central business district.

The NDD provides supplemental cleaning and safety services, as well as marketing and physical improvement programs. It is funded through a special assessment on district commercial and residential properties, billed and collected by the City of Newark's tax collection department and turned over to the NDD for operation management. The NDD is overseen by a Board of Trustees consisting of business and property owners within the downtown District, representatives of non-profit organizations, as well as municipal officials and staff.

Infrastructure works and projects that been able to be delivered by the NDD are outlined in the following table.

Initiative	Benefits
Pedestrian-friendly infrastructure, such as footpath widening and landscaping.	<ul style="list-style-type: none"> <li>- Provides City of Newark to deliver 'excellent levels of service' to those areas that require/warrant additional investment.</li> <li>- Increases visitation to the downtown and provides the opportunity for traders to expand their opportunities to include outdoor seating.</li> </ul>
Building Façade Improvement Program (Grant program providing 1:1 matched funding opportunities between NDD and property owners).	

<p>Military Park</p>	<ul style="list-style-type: none"> <li>- Increases business investment in the district as well as business diversity</li> </ul>
<p>Broad street Improvements (main shopping street)</p> <ul style="list-style-type: none"> <li>- Lighting</li> <li>- Gateway treatments</li> <li>- Planters</li> <li>- Cleansing services</li> </ul>	<ul style="list-style-type: none"> <li>- Increased revenue to local economy</li> <li>- Greater sense of 'pride of place'</li> <li>- Creates positive feedback cycle of further investments.</li> </ul>

Further information is available via: <http://www.downtownnewark.com/>

*Some examples of the NDD*



One of the potential disadvantages of special assessment district funding is the loss in flexibility that arises when the funding pool can only be expended on highly specified outcomes. If there were a change in priorities over the life of the assessment there would be very little ability to adjust funding to match the emerging issues / priorities.

In terms of seeking other funding opportunities, the City of Newark also highlights their focus on **leveraging relationships** as a means to secure external funding for key priority issues. For example, in the area of infrastructure resilience, the City of Newark has strategically engaged FEMA (Federal Emergency Management Agency) with other jurisdictions, including the City of New York, to secure funds for climate change adaptation initiatives. The City of Newark place a strong emphasis on building relationships with other authorities and agencies and on leveraging these relationships to collaborate and share resources and expertise.

#### 4.4 Valuation

The evaluation processes being used by leading municipalities to measure the social, economic and environmental benefits of public works programs and projects over the medium to long term are critical to ensuring continuous improvement in delivering public works projects and services and maximising value.

One of the innovative evaluation mechanisms observed on the trip was Miami Dade County's use of **'Brain Trusts'**. These were oversight committees, comprising academia, engineers, architects and urban planners from the public and private sector, formed to review and evaluate specific challenges, programs and/or initiatives of the organisation. For example, Miami Dade County, containing significant lengths of coast line, are particularly vulnerable to the impacts of climate change. To ensure that they were incorporating the best available information and most up-to-date knowledge in the planning, development and delivery of their works programs, the County invited a panel of experts to review and evaluate their approach and make recommendations for future improvement. This was particularly useful for the issue of climate change given that the responses required are not well established and many initiatives are being undertaken for the first time.

A similar initiative has been established by Miami Dade County which has been coined as a **'mind mixer'**. Again, the purpose is to use the collective intelligence available to the employees of the County through engaging with relevant experts within the broader community. This concept has been slightly expanded at Miami Dade, as they also invite community representatives to be involved and to hear information about projects and proposals that impact their communities.

A range of review processes have been established at the City of Miami Beach to ensure that evaluation mechanisms are included in the delivery of their \$1.2B Capital Improvement Program. Interdepartmental reviews are a mandatory step in the project development and bid process, independent 'peer reviews' of design and estimate costs are undertaken as part of project/program delivery and a **'Post Implementation Project Review'** is completed for all medium to large size projects to ensure any conclusions or opportunities for improvement arising from the evaluation can be communicated across the organisation and considered in the delivery of future projects.

Representatives from the City of Miami Beach commented that these evaluation mechanisms have created a '**learning organisation**' culture within the organisation which in turn has brought about a increasing focus on innovation, productivity improvements and cost savings.

One of the key factors underpinning successful evaluation processes is the need for accurate data which can be efficiently analysed and reviewed. The City of Newark cited their use of data as one of their key innovations of the last five years. Using data to inform decision making and resource allocation was a key focus, as was ensuring that the data could be 'opened up' both internally and externally as a means of establishing higher levels of transparency and reviewing the organisation's performance in key service areas. The City of Newark also cautioned against the production of data for data's sake and advised that clear objectives, targeted reporting and a minimum level of skill in data interpretation were all required if maximum value was to be obtained.

One of two impressive initiatives undertaken by the City of New York Department of Transportation in evaluating public works projects was that via their 2012 report '**Measuring the Street: New Metrics for 21<sup>st</sup> Century Streets**'. This report, an extract of which is shown below, measures the outcomes / results of a sample of Complete Street initiatives. It shows the very clear linkages between activating public spaces through both soft and hard infrastructure improvements and the economic development and social benefits which result. This report includes a 'Street Redesign Inventory' outlining the range of options available to public works agencies to replicate the results that have been delivered by the City of New York. The full report is available via: <http://www.nyc.gov/html/dot/downloads/pdf/2012-10-measuring-the-street.pdf>

The New York City Department of Transport (NYC DOT), are clearly global leaders in not only transforming city streets into more welcoming and efficient spaces, but also in developing a comprehensive set of metrics to assess how street projects have advanced the City of New York's goals of safety, efficiency, travel choice and economic vitality. In late 2013, the NYC DOT published '**The Economic Benefits of Sustainable Streets**', building on their 2012 '*Measuring the Street*' report, by providing a robust methodology for evaluating the economic effects of street improvements. Examples in this report confirm that street projects that improve safety and design and welcome pedestrians, cyclists and public transport users, see higher retail sales. One of the examples provided is Brooklyn's Vanderbilt Avenue (refer photographs below), which saw a doubling in retail sales in the three years following installation of bicycle lanes and a tree lined-median, significantly out-performing both local and city-wide trends. This report establishes the very strong link between city streets and their myriad of impacts on urban life and economics and provides a strong example of the evaluating the overall outcomes of key public works programs provided by municipalities.

## Case Study 1: Vanderbilt Avenue (Plaza Street to Dean Street), Brooklyn



### Transforming an underused parking area: Pearl Street (Brooklyn)



### Creating a seating area out of curb lane: Pearl Street (Manhattan)



An excerpt from the 2012 New York City Report 'Measuring the Street: New Metrics for 21<sup>st</sup> Century Streets'.

The City of New York also emphasise the importance of a **'Post Implementation Review'** for all projects. This includes evaluating the project against 'project specific metrics' that are developed at the time the business case for the project is presented and funding is approved. The relevance of this information is further validated through the review of the evaluation results by senior management and via their inclusion in the annual 'Mayor's Management Report'.

#### 4.5 Public Works Leadership

Being provided with the opportunity to visit 16 different agencies and organisations within the four week study tour period facilitated a unique insight into the correlation between leadership styles and organisational culture and success. Many of the study tour participants commented on the different types of 'atmosphere' that were experienced in each of the organisations visited and the connection this had to that agencies effectiveness and degree of innovation. It was also interesting to note that the availability of resources was not necessarily a strong predictor of success. In fact, many of the smaller agencies exhibited far greater success and dexterity in their delivery of infrastructure services, particularly when considering their access to discretionary funds.

The leadership exhibited at the Alameda County Public Works Agency clearly had a strong focus on **innovation and employee engagement**. Alameda were the eighth public works agency in the USA to obtain APWA accreditation status and their Director, Public Works, has been recognised as one of America's most influential engineers in 2014. The focus on innovation and employee wellbeing translated not only into examples of best practice public works but also into very high levels of empowerment, connectedness and pride in team members. Management at Alameda were clearly focused on their role in driving innovation and shared with the study tour participants the continuous improvement journey they had implemented over the previous five year period which they entitled **'Project Excellence'**. This process involved:

- Developing a process for **benchmarking** their performance against leading public works agencies in the United States and internationally.
- Identifying key **metrics** that best reflected the performance of core tasks so that they were in a position to objectively measure their success.
- Establishing efficient and effective data collection processes to enable open, transparent and **data-informed discussions** with their team members.
- Creating a friendly sense of competition between teams and camaraderie within teams in **celebrating performance success**.

This process was clearly an engaging one for all involved and employees (non-supervisory staff) were key participants of the entire process. At Alameda, team members:

- Were invited to nominate to participate in benchmarking tours which involve travelling interstate to visit other organisations to view examples of best practice.
- Drive and develop the training and education program delivered by the agency.
- Participate in 'optioneering' processes to ensure that the most appropriate course of action is selected and that there is a level of ownership by all relevant staff in the decision that is made.

- Develop employee information forums on topics of interest to team members.
- Benefit through recognition of their contribution via employee excellence awards.

*Study Tour Participants Meeting with Alameda County Public Works Agency*



The City of Miami Beach shared with the study tour group the change management process they had implemented over the previous three year period. The changes were brought about as a result of a change in City Manager. The changes to the municipality involved a restructure, a focus on breaking down silos, establishing a culture of excellence and a focus on performance measurement and evaluation. Key initiatives of this change included increased focus on:

- A 'One Team' approach to delivering works and services
- A focus on maximising the value of 'community dollars'
- Staff picnic and social events to encourage relationship building
- Presentations for staff from various motivational speakers
- Encouraging staff to telephone their colleagues rather than email

The Director's Roundtable discussion at the APWA conference was a unique opportunity to hear from numerous Directors of Public Works from across Canada and the United States on their perspectives on leadership. Key statements made on leadership innovations during this discussion included:

- The important of building organisational pride through recognising and celebrate success.
- The importance of the leadership group's role in facilitating communications about projects and works programs.
- Taking the opportunity to tap into the collective intelligence of team members wherever possible
- The need for public works professionals to think about the branding, marketing and communication of their works/projects.
- A business case, whole-of-life approach to project evaluation is now essential.
- Leveraging the opportunity to utilise 'user fees' as a means of paying back capital investment over time.
- The importance of process rationalisation and understanding where opportunities for efficiency and productivity improvement can be found.
- Thinking outside the box to maximise revenue opportunities (eg selling advertising on public works equipment).
- Ensuring talent is nurtured and grown and skills gaps are identified and rectified through adequate succession planning.
- The need to facilitate 'in-house university' opportunities to provide the space and time for senior technical expertise to be passed on to junior engineers.



*China Town, San Francisco, California*



## **5. Key Recommendations**

### ***Engineering Agility***

1. Identify how placed-based planning can be applied in the Victorian Local Government Context through the use of the concept of 'Complete Streets', 'Liveable Streets' or precinct planning.
2. In controversial projects or programs, consider the role of a pilot program or trial or temporary works in providing evidence to stakeholders of the benefit of the initiative.
3. Ensure social-based outcomes are considered in developing and scoping works programs.
4. In planning and designing works, consider opportunities for multi-functional use of infrastructure and public spaces.

### ***Organisation Alignment***

5. An Implementation Plan is a critical component of effective project/program delivery. The plan should include clarification of roles and responsibilities, change management protocols, key decision making 'gateways', quality assurance and control, risk management and transparency and communication.
6. Multi-factorial assessment and evaluation of potential infrastructure projects/programs should be used as a means of facilitating integrated public works outputs from a social, economic and infrastructure asset perspective.
7. Peer reviews should be utilised as a means of quality control, skill acquisition for junior engineers and knowledge handover from senior engineers.

### ***Leveraging Funding Opportunities***

8. The Special Charge Scheme provisions with the Local Government Act (1989) should be further utilised as a means for Council's to deliver tailored service level outcomes to specific cohorts, such as traders within commercial centres.
9. Local Government should invest adequate time into building and strengthening relationships with external State and Federal Government departments, academia and the private sector as a means of securing both knowledge and infrastructure capital for the organisation.

### ***Evaluation***

10. Oversight committees or 'brains trusts' comprising internal and external expertise should be used as a means of reviewing and evaluating key initiatives and programs within Local Government, particularly for complex, challenging or emerging issues such as climate change, place-making or infrastructure resilience.
11. All significant infrastructure projects above a minimum threshold should be subject to a Post Implementation Review to ensure all relevant continuous improvement opportunities are identified and actioned as appropriate. Project or program specific metrics, identified prior to implementation, should be a key focus of the review.

12. Performance evaluation exercises should, wherever possible, involved data-informed reviews and discussions with the data prepared and produced serving specific information needs.

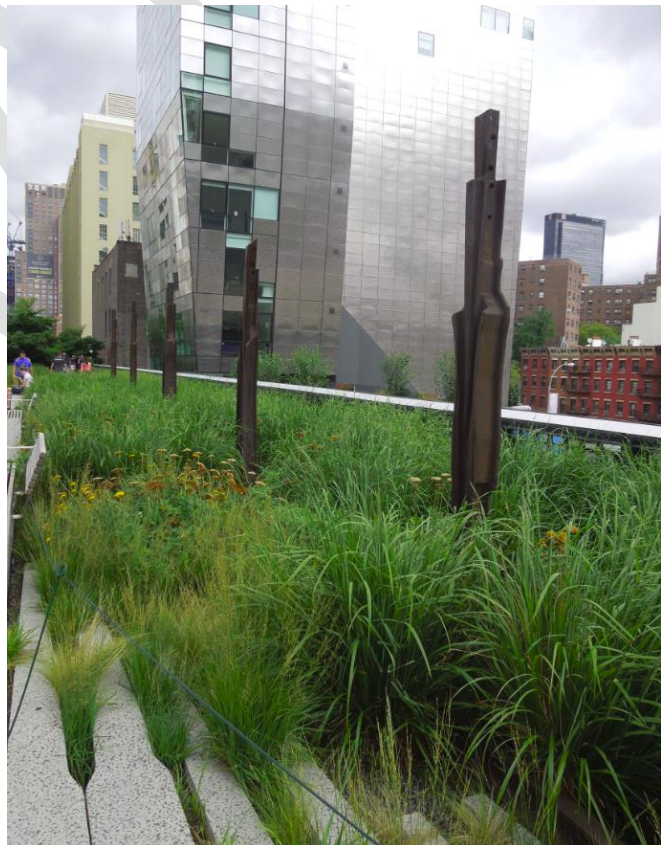
### ***Public Works Leadership***

13. Employees should be engaged in the processes of benchmarking their performance, identifying opportunities for improvement and setting key goals and objectives for maximum value to be achieved.
14. Progress towards organisational objectives should be celebrated regularly to establish and maintain momentum and to acknowledge and recognise performance.
15. The collective intelligence of team members should be recognised and appropriate mechanisms to extract the full value of this intelligence should be implemented.
16. 'In-House University' opportunities should be provided for public works staff as a means of ensuring that space and time is provided for senior technical staff to pass on their expertise and knowledge to junior, less experienced team members.

## **6. Conclusions**

The 2014 MEFVic Study Tour to the United States, Canada and the United Kingdom provided a unique opportunity to visit and learn from public works agencies across the world and to grow both personally and professionally as a leader in local government engineering in Victoria.

Whilst overall infrastructure management in the local government context in Australia is in many ways more progressed than many of the cities visited as part of the study tour, five key innovation themes emerged from the visit. These themes cover the need for engineering agility and activity alignment, the opportunity for leveraging available funds and the role of evaluation and leadership in maximising the overall community value of the ratepayer dollar.



*High Line Park, New York City*