Municipal Engineering Foundation Victoria

Municipal Engineering Foundation International Study Tour 2013

Project planning and governance in local governments

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Bayside CITY COUNCIL

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1. Executive Summary

The Municipal Engineering Foundation of Victoria was established in 1966 to provide opportunities for engineers working in local government to enhance their technical and managerial skills. Scholarships are awarded each year to allow engineers to research overseas study topics including attending the American Public Works Association (APWA) Annual Congress in association with study tours within United States of America (USA), Canada, Europe and the United Kingdom (UK). Reports like this one detail observations, reflections and recommendations from the study tour that will hopefully allow Victorian local government engineers to learn from international experience to improve their work practices.

My topic of interest was Project planning and governance in local governments. With four others, I travelled to the USA, Canada and the UK between 17 August and 10 September 2013. During the tour, we visited several local governments and public infrastructure authorities and attended the APWA Annual Congress held in Chicago.

This study tour provided an outstanding opportunity to view, first hand, international practice and to meet and discuss the experiences of other public works practitioners. The networking and discussions have allowed me to compare and contrast Australia against other cities ranked amongst the most liveable in the Mercer Quality of Living Survey.

The international local governments visited provided many more services than Victorian councils including police, fire and hospitals. The City of San Francisco, for example, has 30,000 employees and is undertaking a US$4.5 billion project to construct a transport interchange terminal. The City of Toronto has a directly elected Mayor and 44 elected councillors, the City of Westminster has 60 councillors and the City of Manchester has 96 councillors. In contrast, the City of Napa has a Mayor and four councillors. Victorian councils have between five and 11 councillors.

There are significant differences between local governments in Victoria Australia, North America and UK in the responsibilities, political structures and key issues that are faced. There is also a wide variation in the size, resources and capabilities of local government within North America and the UK. However there is much in common in the area of project planning and governance. The issues of project timelines, increasingly complex projects, contracting models and contract and project governance are similar to those we are familiar with in Victoria.

There was evidence of well developed forward planning and budgeting systems for projects and analysis of delivery methods, as well as systems to keep elected representatives informed of project status. There was a traditional approach to project delivery in the USA with more contemporary methods having been implemented in Canada and the UK.

1.1. Organisations visited

1.1.1. USA - California and Illinois

San Francisco

- City and County of San Francisco
- City of Napa
- Golden Gate Bridge Highway and Transportation District

Chicago

- Village of Arlington Heights
- City of Chicago - Department of Water
- City of Chicago - Midway Airport
- Chicago Metropolitan Water Reclamation District
- Soldier Field Stadium management organisation
- Chicago Metropolitan Agency for Planning
- Trump Tower Facilities Management

1.1.2. Canada - Ontario

Toronto

- City of Burlington
- Regional City of Halton
- City of Toronto

1.1.3. United Kingdom

London

- Environment Agency - Thames Barrier
- City of Westminster

Manchester

- City of Manchester
- Tameside Metropolitan Borough

1.2. American Public Works Association Congress

The 2013 APWA International Public Works Congress was attended by around 8,000 delegates. It provided four days of technical and development sessions and a large trade exposition at the McCormick Centre in Chicago. The congress offered over 125 technical and professional development sessions covering 14 themes, 'first timers' event, international delegates reception, over 400 exhibitors (8,400m^2), a selection of technical tours and social functions that allowed for more casual networking and relationship building with congress attendees. The congress covered a wide variety of topics in public works and was a highly professional, high standard event.

1.3. Project planning and governance

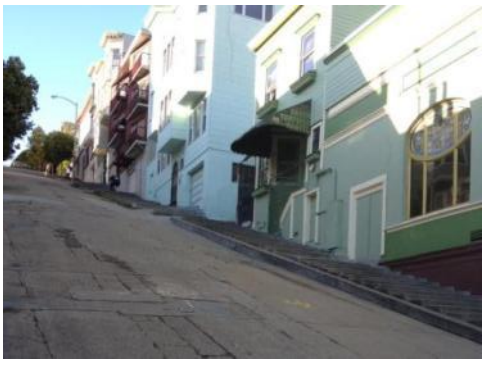
The objective of this report is to examine the way projects are planned and delivered, contract models used, the key steps taken and methods used to progress through the project management process including project governance and project risk.

This study tour provided an opportunity to observe and learn how projects are progressed in other countries by visiting organisations and meeting with relevant staff and networking at the APWA Congress. The overseas visits demonstrated that many practices in Australia follow similar systems and that there some key differences, mainly due to the different structures of government. It was apparent that the overseas organisations visited were better equipped to deal with large and complex projects in terms of planning and governance arrangements. Sufficient time was spent in the planning phase to develop and resolve project scope and design. Routine monthly and quarterly reporting was the primary method of keeping councillors informed. In Victoria there are some examples of different contracting models being implemented. Maddocks Lawyers and Ernst & Young have developed the Major Projects Guidance. The Guidance aims to assist in the development and implementation of Major Projects.

The 2011 Victorian Auditor General's Report into Business Planning for Major Capital Works and Recurrent Services in Local Government found that Victoria's 79 councils collectively spend around $7.6 billion on capital works and recurrent services annually and manage over $60 billion of community assets.

Local Government in Australia has approximately $212 billion in assets and infrastructure under management. Councils have an obligation to ensure that funds are expended appropriately to deliver works and services. Many projects and services in the public works arena are delivered by external parties under contract.

The ability of a municipal organisation to plan and deliver capital works projects can be a key to its success in the eyes of its community. Municipal project delivery varies both in process and in success. There is a trend for larger and more complex projects with an increasing expectation on accountability.



2. Key findings and recommendations

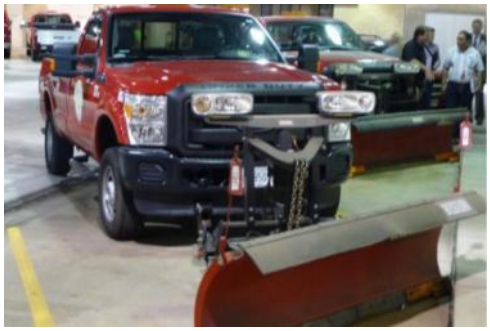
Recommendation 1
A critical analysis should be completed prior to commencing the development of a contract to establish what contracting model will deliver the best outcome relevant to the project in terms of time, cost, quality and risk exposure. The Major Project Guidance developed by Maddocks Lawyers and Ernst & Young has been developed to assist.

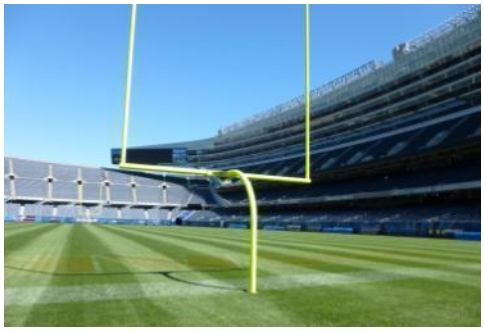
Recommendation 2
Sufficient time should be allocated in the project development phase to ensure time is available to research and review contracting models.

Recommendation 3
Work closely with elected representatives during the development phases of a project to grow confidence in the ability of the organisation to deliver projects and lessen the potential for misalignment of expectations. The scope of a project should be well articulated and 'signed-off'.

Recommendation 4
Develop sound reporting structures to keep elected representatives abreast of projects but not requiring in depth analysis and reporting on design detail.

Recommendation 5
Consider establishing Councillor Steering Committees for major projects (relative to the budget of the organisation) to enable expectations and information to be discussed between the organisation and councillors. This is in addition to Project Control Groups and other project governance arrangements formed to assist the project team. Steering committees should be established in the context that they are not decision-making bodies and that council is the only avenue for councillors to contribute to decision-making. Officers will make decisions based on established council policy and the forums are an avenue to keep councillors informed on details of the project.





3. Introduction

The structures of international governments and the local authority frameworks are different to what we experience in Australia and also vary between the countries visited. Notwithstanding this, it is clear that there is a common theme where local authority public works engineers are a conservative bunch, facing many of the same challenges in project and service delivery as in Victoria. The challenge of constrained, and in some cases reducing, budgets is universal (worst in the UK). The difficulties of having elected representatives consider non-traditional contracting methods is experienced across the globe, however, it was observed that there was little direct involvement by overseas councillors in project delivery once a decision was made to progress.

North American municipal organisations are conservative in the approach to procurement and delivery of projects and services. There was limited evidence of contracting models other than a traditional design - bid - build approach or a schedule of rates approach for service contracts. There were examples of construction management, however the staff concerned reported difficulties in the approach and a favour for a more traditional procurement methodology. Early contractor involvement was used for large scale projects. Canada did provide some examples of partnership models of contracting.

The UK demonstrated a more progressive approach to procurement of projects and services, although traditional design - bid - build still prevailed. The tough economic climate appeared to be driving a change in practice, particularly around maintenance services. There was evidence of partnering contracts, referred to as joint ventures (more akin to what we would refer to as an alliance) of around ten years duration and Private Finance Initiatives (PFI) with contract terms of 25 years.

The local governments visited demonstrated a streamlined approach to project delivery. There was a strong commitment described by municipal staff that once the elected representatives had decided on a project, the organisation was charged with the delivery of the project in accordance with the organisational guidelines and policies, with project updates provided via the routine budget and performance reporting frameworks. There was no evidence that design details or items of a technical nature were the domain of the elected body. Portfolio councillors are common.

In Victoria, some examples of innovative project delivery and contracting models are emerging. It is observed that councillors in many local governments seek to maintain a detailed interest in projects and, where warranted, it is good practice to develop a mechanism to address this matter, either via project reporting or the establishment of forums to allow meaningful information exchange.

Maddocks and Ernst & Young have developed a Major Projects Guidance as a tool for public works engineers in Australia.

4. Project planning and governance

4.1. Planning and delivery

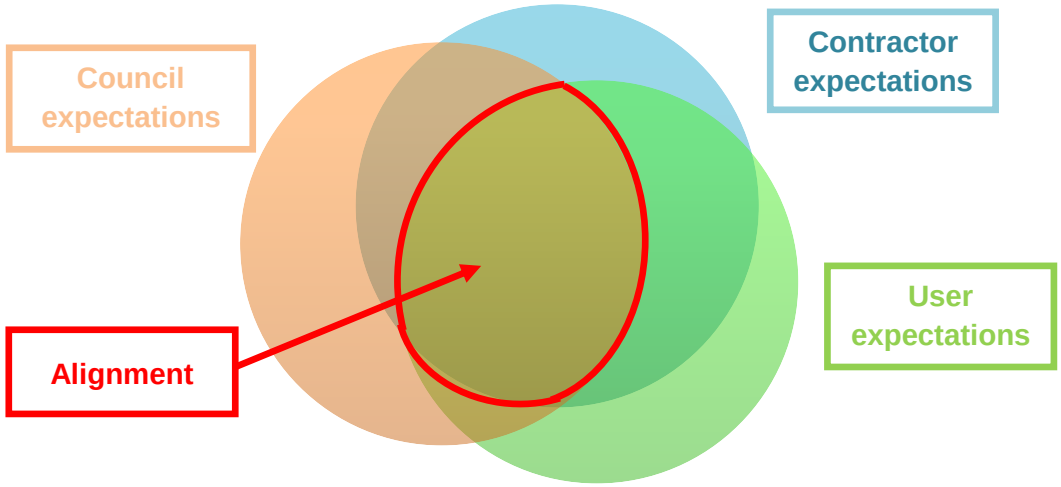
Local governments typically use traditional procurement, a tender based method using an input specification and a somewhat adversarial contractual framework following a short timeframe for the design development and detailed design. Traditional procurement incorporates:

- A project specification issued by council (often developed by consultants) that provides a definitive requirement of the works and/or services to be supplied by the contractor. In the case of public works, this will generally refer to the design, the method of construction and the finishes.
- A tender evaluation process often weighted in favour of lowest cost.
- Separation of the design, project management and construction tasks.
- An adversarial contractual framework.

In practice, traditional procurement raises several problems, which become more acute as the scale and complexity of the project increases, particularly if insufficient time has been allocated to the scoping and design phase.

A lack of common purpose can be evident between council and the contractor with the contractor having much to gain from an incomplete specification and variations to the contract or changes to the specification (scope), which may involve additional works.

Misalignment may also be present in the eyes of the asset user, where there is a difference between the expectations of the asset user and the asset being delivered. This can be an outcome of poor scope development and insufficient engagement with the relevant stakeholders during the design phases of a project. Project managers should aim to maximise alignment.



Traditional construction contracts are designed to transfer construction risk to the contractor. In the event of variations, which are not uncommon, the contractor often seeks to maximise its margins and expand the scope of the contract. However, the principal's objective is to minimise variations and ensure that the project is delivered on time and within budget. These are competing objectives, and frequently result in protracted and sometimes costly negotiations at, or following, completion of the works.

There is reduced scope for new technology and design and construction innovation in a construct only contract. Neither party to the contract is encouraged or rewarded for innovation because the scope of works is narrowly prescribed within a detailed specification and design.

Construction contracts are awarded to contractors not usually involved in the design. The tender process is a task to meet the specification at lowest cost.

Disputes over the scope of the contract can lead to rework, variations (continuing well past the completion date) and ultimately litigation. This is costly, in terms of time, budget and reputation. Traditional procurement often results in problems with post completion contract disputes, cost and time overruns.

A contract arrangement where the contractor assumes some or all responsibility for detail design and methods of construction with collaborative contractual environments and early consultation with stakeholders and maintenance managers in the design stages of the project offers incentives to innovation and new technology and can improve long-term outcomes.

Observations from visiting San Francisco, Toronto, Halton/Burlington, Westminster, Manchester and Tameside councils demonstrated that these organisations understand the need for project planning and that large and complex projects can take many years to deliver. These organisations provided sufficient time at the 'front end' of projects to ensure a reasonable scope was developed, concepts produced and detail designs completed before proceeding to tendering and construction. This allowed for budgets to be appropriately set, community expectations to be managed and for projects to be sufficiently documented to ensure a successful outcome.

While a traditional design-bid build approach was prevalent internationally, there were examples of contracting models for larger, more complex projects that sought to develop a partnership between council and contractor with project risks allocated to the party best able to manage those risks.

Local governments in Victoria have been slow to consider alternate contracting models where the design risk is transferred to the contractor, arguably the best party to manage that risk and the best party to consider innovation. Long term responsibility for work under build and maintain arrangements are also uncommon. It seems that there is a need to know exactly what will be built, through approval of the detailed design, rather than a focus on what service level the asset must achieve. International experience demonstrates that alternate contracting models need to be carefully matched to the desired outcome.

Maddocks and Ernst & Young have developed a Major Projects Guidance as a tool for public works engineers in Australia. This document is planned for publication in early 2014. The Major Projects Guidance sets out a best practice procurement framework for the delivery of major infrastructure projects by local government. It has been prepared specifically for local government in Australia, and is designed to take into account the unique financial, legislative and political constraints on local government in each State and Territory.

The document provides councils (particularly executive and senior managers) guidance on how to properly consider a potential major infrastructure project (including delivery of services) through to project delivery and contract administration. Guidance starts with the undertaking of a 'strategic assessment' of the proposal leading to the development of a business case that looks at the service need and any issues to be considered, financing options, procurement options amongst other things. The idea is that the Guidance will lead to a well-developed and well-reasoned business case which will support the project proceeding. The Guidance then gives direction as to how to develop up the project documentation and the processes for taking the project to the market and concluding a contract. A launch of the Major Project Guidance is anticipated to occur in February 2014. An extract from the Major Projects Guidance is provided in Section 8.1.

There are a range of alternate contracting models that might be feasible depending on the appetite of the market, the length of contract, the value of the project and the risk management approach being taken:

- Design and construct
- Construction management
- Managing contractor, with or without a guaranteed maximum price
- Alliance
- Early contractor involvement
- Various forms of Public Private Partnerships

These models of contracting are also described in the APWA's publication on Project delivery systems. An extract from this publication is provided in Section 8.2.

It is considered that a more proactive approach to assessing project delivery options is necessary when municipal organisations embark on projects and contracts with a value of over $5 million.

4.2. Project governance

Many Victorian local governments do not have a long term view for future capital works and future service needs. The current phase of the Municipal Association of Victoria's (MAV) STEP Asset Management Program seeks to address this shortcoming. The four yearly election cycle would seem to encourage decision makers to focus on the short term needs of the current term of office, although a commitment to long term financial planning is the norm. Assets are long lived, and there is a need to plan well in advance for works and services. Asset management in Australia is advancing the need for budgets to adequately address the renewal gap and future funding to being managed to close the renewal gap. Australia was observed to be more advanced in this regard than North America and the United Kingdom. What is not so well advanced in Victoria is the actual project planning for asset renewal, or the asset planning required for new or changing services. The need for councils to apply an annual capital budget cycle also promotes a short term view. Internationally, capital budgets are adopted with duration of longer than one year.

Project planning in councils is improving despite the one year capital works budgeting that is driven by an annual budget process. Many councils are developing three and five year capital works plans to allow for scoping, design, relevant approvals and detailed stakeholder engagement to be completed in a systematic way to ensure projects are shovel ready when the funding year arrives. This process also allows budgets to be modified as the service driven elements of the project are refined so as to ensure the assets as proposed, delivers the required service needs. This was observed to be beneficial internationally.

There is a level of detail required by councillors in Victoria that was not evident in other countries requiring sound project governance arrangements. Councillors often involve themselves in a level of project detail that can distract the professional staff and designers from focusing on good service driven outcomes for the long term. Some Victorian councils have developed structures to engage with councillors during the development and delivery of projects to ensure the elected representatives have a good understanding of those projects.

The different structures of the international local governments resulted in a streamlined approach to project delivery. There was a strong commitment described by all municipal staff encountered that once the elected body had decided on a project, the organisation was charged with the delivery of the project in accordance with the organisational guidelines and policies, with only routine project updates to be provided via the routine budget and performance reporting frameworks. There was no evidence that design details or items of a technical nature were the domain of the elected body. Portfolio councillors were common and there was a trend towards publishing relevant project information and reporting in the public domain.

5. Conclusion

The 2013 MEF International Study Tour was a tremendous experience. It provided an opportunity to travel extensively to visit many varied public works authorities in three countries. The study tour provided an unequalled professional development opportunity to research international practices, meet overseas public works practitioners to discuss similarities and differences and to build strong friendships with my study tour colleagues.

It was evident that the organisations visited had sound project planning systems in place to see projects successfully developed and delivered. Some organisations were using contract models that introduced the construction contractor to the design stage of a project to manage risks aimed at maximising innovation and project success. Longer term partnering contracts were also being used.

Overseas organisations used routine reporting to inform councillors of the status of projects. It was apparent that councillors did not have an active interest in direct project details (design or construction) and that organisational policy and systems were in place to address councillors' information requirements. There was a trend towards making relevant project information available to the public.

I would recommend this experience to others as a once in a lifetime event.






6. Study tour visits and interactions

This section details the organisations visited and the observations made regarding project planning and governance. The organisations visited varied greatly and provided a broad range of material for reflection.

The staff who hosted us at each visit were exceptionally friendly and helpful. They were keen to provide us with the information we sought and were also very interested in hearing from us about how we did things in Australia. I would like to think that our hosts gained as much from the experience as we did.

6.1. County and City of San Francisco, California, USA

6.1.1. About San Francisco

San Francisco is the only consolidated city-county in California. It is the most densely settled large city in California and the second-most densely populated city in the USA after New York City. The city is also the financial and cultural hub of the larger San Jose-San Francisco-Oakland metropolitan area, with a population of 8.4 million.

The mayor is also the County executive, and the County Board of Supervisors acts as the city council. Under the city charter, the government of San Francisco is constituted of two co-equal branches. The executive branch is headed by the mayor and includes other citywide elected and appointed officials as well as the civil service. The 11-member Board of Supervisors, the legislative branch, is headed by a president and is responsible for passing laws and budgets, though San Franciscans also make use of direct ballot initiatives to pass legislation.

The members of the Board of Supervisors are elected via wards.

Land area:	121km^2	Budget:	US$6.83 billion in 2011/2012
Population:	825,000 in 2012	Employees:	30,000
Density:	6,803 people/km^2	Established:	1856

6.1.2. San Francisco observations

The San Francisco organisation is large and well resourced. It has dedicated and bespoke systems (Enterprise Project Management) for project management that are integrated with organisational systems (although some integration was still being implemented) and well utilised by staff. These systems are used for reporting and governance purposes, both within the organisation and to State and Federal levels. There was work being done to make the information available within this system accessible by the public.

It was reported that for projects of up to US$5 million, traditional design-bid-build contracts were used. For larger projects, construction management was the preferred method of delivery.

For maintenance contracting, a bundled lump sum approach was utilised.

San Francisco used a five year coordinated capital work programming tool to manage projects and works across all departments.

The staff advised that other than the routine management and project reporting, there were no specific committees or arrangements regarding the governance of projects that involved the elected representatives. The organisation was given the responsibility of delivering the approved projects.

6.2. City of Napa, California, USA

6.2.1. About Napa

The City of Napa is the principal city of Napa County about 90km north of the San Francisco area. It is renowned for its vineyards and wineries.

The Napa City Council consists of a Mayor and four council members all elected at large for terms of four years. The City of Napa is a Charter City with Council-Manager form of municipal government. The City Manager is selected by the Council and serves as the administrative head of the City.

Land area:	47km^2	Budget:	US$62 million in 2011/2012
Population:	77,000 in 2010	Employees:	465
Density:	1,636 people/km^2	Established:	1847

6.2.2. Napa observations

The City of Napa is a smaller regional city. It has a range of systems and procedures to assist staff in delivering projects and services. There is a focus on transparency and work is being done to make information on projects, works and services available to the community. There is a focus on doing more with less and using technology solutions to achieve this aim.

Asset management systems use condition based information to guide the development of long term financial plans. Roads and bridges are considered to be well managed in terms of renewal, but buildings less mature in asset management terms. This information is used to develop five year capital works plans with a 20 year outlook. Internal systems drive the development of programs, there is little input from the community. Any community requests for projects are assessed ‘as necessary’.

Councillors are kept informed of ‘key projects’ via a quarterly report on performance against time and budget. It was observed that councillors have little or no role in projects once a decision to proceed is made and council and councillors allow the organisation to deliver projects.

A design-bid-build approach is used for project delivery, often with a two stage process using an Expression of Interest to select contractors to be invited to tender. The lowest cost is the ultimate driver in selecting a contractor.

Napa is consolidating a coordinated advanced design program were funding for projects spans a number of years to allow for scoping, feasibility, design and construction phases to be staged and given appropriate time for each phase to be completed.

6.3. Golden Gate Bridge Highway and Transportation District, California, USA

6.3.1. About Golden Gate Bridge Highway and Transportation District

The Golden Gate Bridge opened in 1937. The Golden Gate Bridge Highway and Transportation District operates the Golden Gate Bridge and two public transit systems for San Francisco: Golden Gate Transit buses and Golden Gate Ferry. Last year, 38 million vehicles crossed the Golden Gate Bridge and over 9 million customers rode the transit systems.

The Board of Directors of the Golden Gate Bridge, Highway and Transportation District is comprised of 19 members, representing six counties.

The organisation's budget for 2012/13 was US$240 million with 733 employees, 165 work on the bridge. The bridge operating budget is US$52 million per year.

6.3.2. Golden Gate Bridge Highway and Transportation District observations

The Golden Gate Bridge Highway and Transportation District collects income from tolls. Tolls are set with a view to the long term expenditure needs of the bridge. The organisation utilises reserves to fund future capital and major maintenance works.

The works on the bridge are planned in almost military fashion. There is a high degree of engineering input and robust assurance systems to review design before implementation.

The process of design - bid - build is exclusively used for bridge works and the Board of Directors do not involve themselves in the detail of capital projects or operational projects.

6.4. APWA Chicago Chapter arranged visits, Illinois, USA

The Chicago Chapter of the APWA arranged two days of site visits for our study tour group. We were hosted by four members of the Chicago Chapter, Mike Millette, Steve Weinstock, John Mick and Vydus Juskelis. As part of these visits, we were joined by the tour group from the Institute of Public Works Engineers Australasia (IPWEA) (five Australian engineers), two other international engineers from Europe and Warren Roberts, MEF Victoria Chairman of Trustees (also Chief Executive Officer at City of Stonnington). The time spent in this enlarged group provided a great opportunity to discuss matters of interest at a more personal level.

The Chicagoan's were all executive level public works engineers. They spent two days transporting our group to a number of site visits. The Chicago Chapter arranged for a number of social events for the group.

6.4.1. Village of Arlington Heights

6.4.1.1. About Arlington Heights

Arlington Heights is a village in Cook County, Illinois, it lies about 40km northwest of the Chicago's downtown area.

Arlington Heights Village Board is elected at large and is composed of eight trustees, and one Village President, who is the Mayor. The Village of Arlington Heights is a Charter City, with a Council-Manager form of municipal government.

Land area:	43km^2	Budget:	US$135 million in 2011/2012
Population:	75,000 in 2010	Employees:	427
Density:	1,700 people/km^2	Established:	1887

6.4.1.2. Arlington Heights observations

Arlington Heights is an urban area of Chicago of a size similar to many Australian municipalities. Arlington Heights staff spoke about the challenge of asset management and the infrastructure renewal gap. A presentation was shown outlining a software solution that was being used to assist in the development of asset management practices. It was observed that the system was currently being utilised as a maintenance management tool, with the vision of it becoming an operations management system aimed at guiding asset management decisions.

6.4.2. City of Chicago
Department of Water
Midway Airport

6.4.2.1. About Chicago

Chicago is the third most populous city in the USA.

The City government is divided into executive and legislative branches. The mayor is the chief executive while the City Council, elected from 50 wards, is the legislative body. In addition to the Mayor, Chicago's two other city-wide elected officials are the City Clerk and the City Treasurer.

Land area:	606km^2	Budget:	US$8.2 billion in 2011/2012
Population:	2.7 million in 2012	Employees:	32,000
Density:	4,500 people/km^2	Established:	1837

6.4.2.2. Chicago observations

The City of Chicago Department of Water is undertaking a significant upgrade of its distribution system. A key project is the upgrading of its Springfield Pumping Station and the conversion of steam driven pumps to electric pumps. The US$80 million pump station upgrade project was designed, bid and is currently being built to a strict specification. There was a high degree of engineering input to the project given its critical nature of providing an essential service. The worksite was clean, orderly and well organised. The design was such that it appeared to

be spacious and allowed for substantial clearances between pieces of equipment. This was an example of where sustainable building principles were being displayed with photo voltaic panels on a section of the pump station roof and a green roof was installed on another section of roof.

The City of Chicago Department of Aviation manages the Midway Airport, a one square mile international airport set in an urban area. The airport has adopted aggressive sustainability targets to reduce energy consumption by 15%, water use by 10% and waste by 50% (based on 2010 levels). It also has a program to reduce the noise impacts of planes on properties and facilities near the airport.

6.4.3. Chicago Metropolitan Water Reclamation District

6.4.3.1. About Chicago Metropolitan Water Reclamation District

The Metropolitan Water Reclamation District of Greater Chicago (District), established in 1889, is an independent government and taxing body encompassing approximately 91 percent of the land area of Cook County, Illinois serving 10.35 million people. The District is a separate legal entity sharing an overlapping tax base with the City of Chicago, and the other public administration bodies in its area.

The District is governed by a nine member Board of Commissioners who are elected at large and serve on a salaried part time basis. Three Commissioners are elected every two years for six year terms. Biannually, the Board elects a President, Vice President, and Chairman of the Committee on Finance.

The Executive Director, who reports directly to the Board, manages the District's day-to-day operations. Eight appointed department heads report to the Executive Director. The Treasurer of the District, its chief financial officer, is appointed by and reports directly to the Board. General Administration, Management and Budget, Public Affairs and Affirmative Action, are direct staff and support units, reporting to the Executive Director.

The District budget for 2011/2012 was US$1.15 billion. The District employs around 1,922 staff.

6.4.3.2. Chicago Metropolitan Water Reclamation District observations

The North Side water reclamation plant is located in an urban area to the north of the Chicago downtown area. The plant was well established with proven maintenance and replacement programs to ensure this essential service was not subject to asset failures.

It was observed that the buildings that form the treatment plant were architecturally designed and that in general, the site was clean and well maintained.

6.4.4. Soldier Field Stadium management organisation

6.4.4.1. About Soldier Field Stadium

Soldier Field is the home of the Chicago Bears National Football League (NFL) team and also hosts over 200 events per year. The stadium is operated by a management company who contract to the Chicago Parks District. The Chicago Bears lease the venue for home games. It is the largest war memorial in the USA.

6.4.4.2. Soldier Field Stadium observations

The company that manages the stadium employs 15 staff to run the venue. This increases with the addition of 4,000 temporary staff on event days. A range of contracts are in place to manage and maintain all facets of the stadium.

6.4.5. Chicago Metropolitan Agency for Planning

6.4.5.1. About Chicago Metropolitan Agency for Planning

The Chicago Metropolitan Agency for Planning (CMAP) is the official regional planning organisation for the north-eastern Illinois counties of Cook, DuPage, Kane, Kendall, Lake, McHenry, and Will with offices in the Sears Tower. CMAP developed, and now guides the implementation of GO TO 2040, metropolitan Chicago's first comprehensive regional plan in more than 100 years. To address anticipated population growth of more than 2 million new residents, GO TO 2040 establishes coordinated strategies that help the region's 284 communities address transportation, housing, economic development, open space, the environment, and other quality-of-life issues.

The CMAP Board is chaired by the mayor of Palos Hills. The Board's membership reflects the regional consensus that led to creation of CMAP, featuring balanced representation from across the counties. CMAP operates under authorising legislation.

An executive director leads the CMAP staff, who have diverse capabilities in comprehensive planning, data research and analysis, and many related disciplines. CMAP has committees at the policy, advisory, coordinating, and working levels that play integral roles in the agency's planning processes.

The Agency budget for 2011/2012 was US$15.8 million. The Agency employs around 102 staff.

6.4.5.2. Chicago Metropolitan Agency for Planning observations

The Chicago Metropolitan Agency for Planning has developed the GO TO 2040, aimed at creating jobs and coordinating development. The CMAP strives to act like a consulting agency and uses a project management approach for its work. The CMAP has a mission of building strong communities and economic prosperity and the staff presenting displayed a commitment to these ambitions. The GO TO 2040 strategy has key themes of:

- Liveable communities
- Human capital
- Efficient governance
- Regional mobility

In comparison, the Victorian State government is currently developing the Plan Melbourne metropolitan planning strategy as a vision for Melbourne. It is an evidence based plan designed to guide Melbourne's housing, commercial and industrial development through to 2050. The vision for Melbourne is: Melbourne will be a global city of opportunity and choice. The key outcomes of Plan Melbourne are:

- Delivering jobs and investment
- Housing choice and affordability
- A more connected Melbourne
- Liveable communities and neighbourhoods
- Environment and water
- A State of cities
- Implementation: Delivering better governance

6.4.6. Trump Tower Facilities Management

6.4.6.1. About Trump Tower

The Trump Tower is a skyscraper condo-hotel in downtown Chicago. The building is a 96-story structure, 423m high including its spire, its roof topping out at 360m. It is adjacent to the main branch of the Chicago River, with a view of the entry to Lake Michigan beyond a series of bridges over the river.

The design of the building includes, retail space, a parking garage, a 339 room hotel, and condominiums.

6.4.6.2. Trump Tower observations

The maintenance and operations of the Trump Tower are managed by a team of building managers who use specialist contractors and consultants to develop and deliver capital upgrade and routine maintenance services.

6.5. APWA International Public Works Congress, Ilinois, USA

6.5.1. The Congress

The 2013 American Public Works Association Congress was held in Chicago, Illinois between 25 and 28 August 2013. It was attended by around 8,000 delegates. The Congress included 125 technical and professional development sessions covering the themes of:

- Career and Personal Development
- Construction Management
- Emergency Management
- Engineering and Technology
- Environment/Sustainability
- Facilities
- Fleet Services
- Management
- Parks and Grounds Snow and Ice
- Solid Waste Stormwater/Flood Control
- Streets/Roads/Bridges
- Traffic Engineering
- Utilities/Right-of-Way
- Water and Wastewater
- A range of technical tours on the final day

6.5.2. Sessions attended

At the Congress, I attended a range of sessions that were of interest to me. Those covered areas of Career and Personal Development, Environment/Sustainability, Construction Management and Engineering and Technology.

The keynote sessions were of particular interest:

- That Used to Be Us: How America Fell Behind in the World It Invented and How We Can Come Back
  Thomas L. Friedman - Best-selling Author and Columnist for *The New York Times*

- A Whole New Ballgame: Chicago's Infrastructure Planning
  Gabe Klein - Commissioner of the Chicago Department of Transportation

- Reality-Based Leadership: Ditch the Drama and Turn Excuses into Results
  Cy Wakeman - Thought Leader and Best-selling Author

Other sessions of note were:

- Green streets and porous pavements (sustainability)
- So you want to build a downtown train station (project/construction management)
- Sustainable stormwater solutions in mature neighbourhoods (sustainability and asset management)
- Asset management and capital planning for underground infrastructure (asset management and long term capital planning)

These sessions, and others, demonstrated that the presenters were all seeking better asset management practices while considering the sustainability implications and the planning and delivery methods required. It was widely acknowledged that asset planning and future funding capacity was a key challenge for public works engineers in the USA. It also demonstrated that, in the USA, there is a preference for the traditional form of project delivery being Design - Bid - Build.

I also participated in the technical tour of the Chicago Deep Tunnel project, a massive system of tunnels and reservoirs designed to mitigate the impacts of flooding on Chicago.

An extract from the Congress program is provided in Section 8.3.

6.5.3. Congress exposition

The APWA Congress included an exposition of over 400 exhibitors covering an indoor area of 8,400m^2. The exposition included a vast array of plant and equipment. It also featured a range of companies providing technology solutions for use by public works practitioners. There were numerous sessions titled ‘There’s an APP for that’ highlighting the emergence of easy to use mobile applications. There were also many exhibitors providing environmentally sustainable products, particularly products relating to lighting.

The exposition provided for many discussions with plant and equipment providers and operators. It is the place to go if you are in need of a snow plough!

A copy of the floor plan for the Congress exposition is provided in Section 8.4.

Lunch was held in the exposition area which provided an opportunity to network with engineers from all over the USA.

6.5.4. Other Congress Matters

One further aspect of the Congress was the opportunity to staff the IPWEA stand. This provided an avenue to meet public works engineers from across North America and a range of other countries, providing an insight into the challenges and successes experienced around the world. This provided a real sense of value to the Congress in addition to its formal aspects.

6.6. Regional City of Halton and City of Burlington, Ontario, Canada

6.6.1. About Halton and Burlington

The Regional Municipality of Halton is a regional municipality of Ontario, Canada, about 60km southwest of Toronto in the Greater Toronto Area. The Town of Oakville and the City of Burlington are largely urban, while the Towns of Milton and Halton Hills to the north are significantly more rural.

The Regional Council consists of the elected Chairman, the mayors of the local municipalities, and regional councillors elected by wards from the local municipalities (who also sit on their respective municipal councils).

Land area:	967km^2	Budget:	CAD$732 million in 2011/2012
Population:	502,000 in 2011	Employees:	2,750
Density:	520 people/km^2	Established:	1974

The Regional Council is responsible for services including transport, public health, schools, water and waste water and arterial roads.

Burlington City Council is part of the Halton Regional Council area. Burlington is situated on the shore of Lake Ontario.

The Council consists of a directly elected mayor plus six councillors, elected via wards.

Land area:	186km^2	Budget:	CAD$205 million in 2012/2013
Population:	176,000 in 2011	Employees:	1,120
Density:	947 people/km^2	Established:	1974

The Council is responsible for services including local roads, animal management, emergency services, community services, parks and foreshore and sanitary services.

6.6.2. Halton and Burlington observations

Halton and Burlington are an area with urban characteristics near Lake Ontario changing to be more rural in nature towards the north. The area was observed to be experiencing many of the challenges faced by Victorian municipalities in terms of asset management, climate change, transport management, storm water management and urban densification.

Asset management is well understood for roads with the first pavement management system dating back to 1990. Asset decisions are supported by data and relevant software analysis for civil assets, less so for buildings. Storm water management is a factor of both quality and volume during peak rainfall events. The region has strategies in place to influence mode change to active transport options, rather than car based transport.

Citizen advisory committees provide input to assist to decision making processes.

The predominant project delivery methodology was the design - bid - build approach. Examples of construction management had not provided good results and were not favoured for future projects.

There was a demonstrated sound working relationship between the local and regional council employees.

6.7. City of Toronto, Ontario, Canada

6.7.1. About Toronto

Toronto is the largest city in Canada and the provincial capital of Ontario. It is located on the north-western shore of Lake Ontario.

The City of Toronto is administered by 44 elected councillors, who along with the mayor, make up the Toronto City Council. A new council is elected every four years. Toronto has a 2012-2021 Capital Budget and Plan of CAD$14.8 billion.

The City Manager reports to the Mayor and City Council.

Land area:	630km^2	Budget:	CAD$9.4 billion in 2012/2013
Population:	2.6 million in 2011	Employees:	34,000
Density:	4,150 people/km^2	Established:	1998

6.7.2. Toronto observations

The City of Toronto is large and well resourced. It has detailed systems to manage assets and project delivery. A dedicated department exists within the organisational structure to coordinate projects delivered by the many departments within the City's structure, with a focus on delivering what was funded. The City's capital works budget is between CAD$0.75-1 billion annually. The City is facing challenges in the areas of renewal and service growth, environmental stewardship and climate change adaption. In August 2013, before our visit, Toronto experienced severe flooding.

The City has a coordinated five year capital works program, with the aim of defining the expectations of each project so that delivery can be achieved with the minimum level of disruption. The program is dynamic and is constantly being refined with the aim of finalising design and approvals processes prior to the delivery year.

The City utilises an advanced GIS system to aid in efficient and coordinated planning of projects. Asset management systems have identified an asset renewal backlog and capital renewal plans have been implemented to reduce this backlog to zero in the next ten years. This has required an increase in rates.

Toronto manages it facilities using the criteria of 'state of good repair' and rates the condition of 20% of its facilities each year.

Toronto uses steering committees for major projects to review material such as international design competition submissions and subsequent implementation of the selected plans.

Toronto has used construction management delivery methodology without success and have resorted to a lump sum approach on some occasions where the construction management approach has failed. The staff reported that scope creep was a concern and emphasised the need to ensure the project scope is known and agreed before works commence.

6.8. Environment Agency - Thames Barrier, UK

6.8.1. About Thames Barrier

The Thames Barrier is the world's second-largest movable flood barrier, located downstream of central London. The barrier, operational in 1982, prevents the floodplain of all but the easternmost boroughs of Greater London from being flooded by exceptionally high tides and storm surges. The barrier is designed to offer one in one thousand year protection.

The barrier spans 520 metres across the River Thames near Woolwich, and it protects 125km^2 of central London from flooding caused by tidal surges. It, along with London's other flood defences, is managed and maintained by the Environment Agency.

The Environment Agency is a non-departmental public body, governed by a board and team of directors responsible to the Secretary of State for Environment, Food and Rural Affairs with the aim of protecting and improving the environment, and promoting sustainable development.

The Environment Agency's annual budget in 2012-2013 was £1.2 billion with about 11,000 employees.

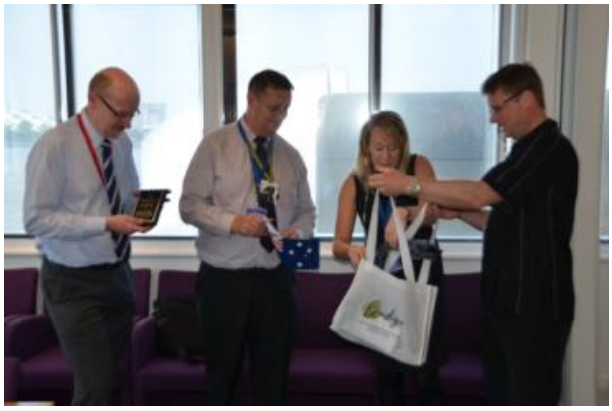
The Thames Barrier employs about 150 people, largely involved in maintenance activities. These people are also responsible for activating the range of flood protection walls and gates that are needed in addition to the Thames Barrier. These include flood gates across roads, drains and other low points.

6.8.2. Thames Barrier observations

The Thames Barrier is a critical piece of infrastructure for London. Any upgrades or changes to the Barrier are done using proven methodology. No 'new' ideas are used on the Barrier as the implications for failure are catastrophic. Design ideas need to be proven in two existing applications before they are considered for the Barrier. The design - bid - build system is the only procurement method used as exact specifications are required to ensure reliability. Sound asset management principles are applied, using a stitch in time methodology for maintenance and renewal. There is a current expectation that the service life of the Barrier will be increased from 2030 to 2070. The implications of this are now being assessed.

The Thames Barrier department reports routinely as part of its operations to the Environment Agency executive. As this is a federal agency, input from elected representatives in minimal.

The quality of the installation was impressive with all elements of the site in immaculate condition.



6.9. City of Westminster, UK

6.9.1. About Westminster

The City of Westminster is an inner London borough occupying much of the central area of Greater London, including most of the West End. It is estimated that over one million people set foot in Westminster each day.

The current City is divided into 20 wards, each electing three councillors. Decisions are made by the full Council, the Cabinet, individual Cabinet Members and Committees. The Council elects the Mayor. The Chief Executive Officer reports to the Council.

Land area:	21.5km^2	Budget:	£220 million in 2011/2012
Population:	219,000 in 2011	Employees:	4,800
Density:	10,000 people/km^2	Established:	1963

6.9.2. Westminster observations

The City of Westminster is large and well resourced. It has established systems to deliver services and projects. The structure of the organisation is known as a Commissioning Organisation that provides a separation of strategy and operations.

The City has systems in place to identify the statutory and discretionary expenditures and prioritises capital and operational expenditure based on a scoring system that aims to minimise any political impacts.

The planning framework for civil projects was advanced, with that for buildings emerging. Asset management principles are used to determine and justify budget requirements and the 'Westminster Standard' has been adopted for service levels. The City publishes a five year capital works program and has a 60 year highways plan.

Zero based budgeting principles are used meaning justification and evidence is required for all expenditure with expected efficiency improvements each year.

Westminster utilises a bespoke budget and reporting system to manage and monitor expenditures.

Contract models used for capital projects in excess of £10 million include target cost and guaranteed maximum price (GMP). For projects under £10 million, the West One joint venture is utilised.

The West One joint venture was described as comprising two constructors and two engineering consultancies. It appeared to be an Alliance Contract. It is a ten year contract for the provision of infrastructure maintenance, design and construction that commenced in 2004. The tender process for the post 2014 contract was underway during our visit.

Westminster engages with its community using stakeholder meetings, street surveys and telephone surveys.

Westminster has portfolio councillors who are engaged with their portfolio area.

The City prides itself on getting things done and the staff interviewed explained that the councillors were accepting of a degree of uncertainty with projects provided there was sound reasoning and explanation. Reasonable contingencies were allowed and for GMP contracts, cost overrun insurance was a consideration. All of this information was aimed at building confidence in the ability of the organisation to deliver.

6.10. City of Manchester, UK

6.10.1. About Manchester

Manchester City Council is a metropolitan borough in Greater Manchester, England. It is composed of 96 councillors, three for each of 32 electoral wards. The Executive is part of the Council which is responsible for most day-to-day decisions. The Executive is made up of a Leader appointed by the Council and a cabinet of up to nine other councillors (including a Deputy Leader) whom the Leader appoints. The Council elects the Mayor. The Chief Executive Officer reports to the Council.

Land area:	115km^2	Budget:	£570 million in 2011/2012
Population:	512,000 in 2011	Employees:	8,000 (excluding schools)
Density:	4,350 people/km^2	Established:	1974

6.10.2. Manchester observations

Manchester is a large organisation that has recently been focused on cultural change and organisational restructuring to create a joined up organisation (remove silos) to respond to the challenge of declining revenues.

The City displayed a high level of understanding of asset management and interestingly, were more advanced in the area of buildings and structures asset management than roads. Typically, it would seem, local governments have understood the long term demands of roads rather than building needs, so Manchester seems unique on this point. Cost constraint has caused Manchester to critically assess and rationalise its building stock, resulting in many disposals. Many buildings were in poor condition following years of neglect.

A joint venture contract was in place for the maintenance of buildings. The City has a Private Finance Initiative (PFI) contract in place for 25 years for the renewal and upgrade of street lighting.

It was commented that the City was negotiating its last PFI contract now and that this method of contracting would be reviewed in future as it had proven to be inflexible.

Manchester utilises a formal capital works planning system of gateways and use a ‘light’ version of Prince2 project management. A list of projects ‘in the pipeline’ is maintained to establish projects beyond the funding horizon. A three year capital budget is adopted and it was said during our visit that “for the first time in a long time we are trying to develop a long term plan”, however uncertain funding made long term planning difficult, with further funding cuts likely.

6.11. Tameside Metropolitan Borough, UK

6.11.1. About Tameside

The Metropolitan Borough of Tameside is part of Greater Manchester about 11km east of Manchester. It spans the towns of Ashton-under-Lyne, Audenshaw, Denton, Droylsden, Dukinfield, Hyde, Mossley and Stalybridge.

The current borough is divided into 19 wards and is represented by 57 ward councillors who elect eight portfolio councillors. The Council elects the Mayor and the Chief Executive Officer reports to the Council.

Land area:	103km^2	Budget:	£400 million in 2011/2012
Population:	214,000 in 2011	Employees:	9,000 (excluding schools)
Density:	2,100 people/km^2	Established:	1974

6.11.2. Tameside observations

Tameside is an organisation going through significant change. Over the last three years, staff numbers have been reduced by 2,000 due to revenue constraints. Like Manchester, Tameside is disposing of buildings to reduce the maintenance and renewal burden, while generating one-off revenue.

Tameside exhibited a preference for in-house service provision in the areas of civil infrastructure maintenance and construction with 'framework' agreements to ensure competiveness for the 80% of in-house civil maintenance works. A joint venture was in place for buildings maintenance, mainly focussed on the delivery of new school buildings.

Tameside utilises internet based discussion forums to engage with its community. The big conversation website, www.tameside.gov.uk/tbc/current enables the community to provide feedback and comments on proposals.

Council is informed of progress via the portfolio councillor and the Executive Board.

6.12. Victorian councils, Australia

A number of councils in Victoria were contacted and asked to provide comments on the project delivery models used and the project governance arrangements. In addition to my knowledge through working at Bayside and Boroondara, councils providing a response were Bass Coast, Greater Geelong, Greater Bendigo, Stonnington, Whitehorse, and Yarra Ranges. Maddocks Lawyers also provided advice.

Some Victorian councils are assessing projects in a manner that considers the risks and opportunities associated with various delivery models. Some have implemented sound project governance arrangements, including non decision-making councillor involvement, but the level of detail offered to councillors varies greatly. Some councils demonstrated use of alternative contracting models, however, most were using a traditional approach.

Alternative models of contracting where the constructor has input to the design are being used in some organisations. Design and construct contracts and Managing Contractor Contracts with a Guaranteed Maximum Price have been successfully used.

Maddocks Lawyers with Ernst & Young have developed a Major Project Guidance as a resource to assist in the development and implementation of projects. The authors have drawn from their experiences in project deficiencies, delays and time/cost blowouts often involving contractual disputes to provide valuable advice in the Guidance.

Many organisations are using on-line methods for community engagement and consultation, for example Bayside's Dendy Street Beach Precinct Masterplan: http://yoursaybayside.com.au/dendy-street-beach.

7. Acknowledgements

I would like to thank:

- The Municipal Engineering Foundation of Victoria for providing this learning opportunity. It was a wonderful experience. The Foundation Chairman, Warren Roberts, provided sage advice in the planning of the tour and was a welcome addition to our touring party for our Chicago leg.

- The Bayside City Council, particularly Adrian Robb, Chief Executive Officer, for encouraging me to apply and for providing support for me to undertake the study tour.

- My travelling partners for their enthusiasm and efforts in making the study tour so memorable:
    - Trevor Dando, Bass Coast Shire Council
    - Samantha Krull, Wyndham City Council
    - Brett Martini, Greater Bendigo City Council
    - Ossie Martinz, Monash City Council

- All of the people in North America and the United Kingdom who hosted our visits and were willing to freely exchange information.

- My family who supported me throughout out this adventure and for allowing me to be away from home for an extended period of time.

8. Attachments

8.1 Major Projects Guidance
8.2 APWA Project Delivery Systems
8.3 APWA - The Best Show in Public Works 25-28 August 2013
8.4 APWA - Congress exposition floor plan

8.1. Major Projects Guidance

Extract from the Major Projects Guidance

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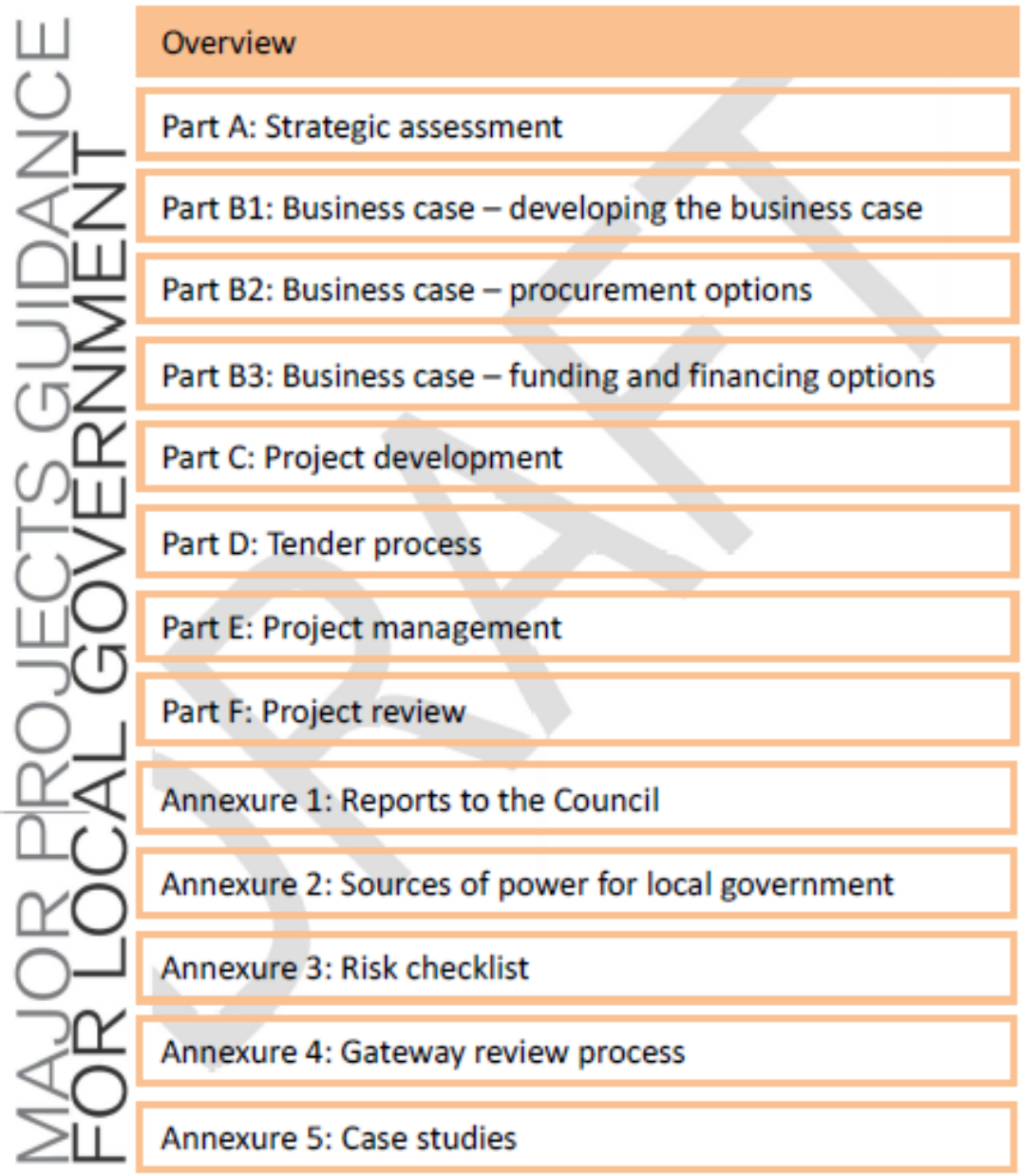
Contents of the Major Projects Guidance



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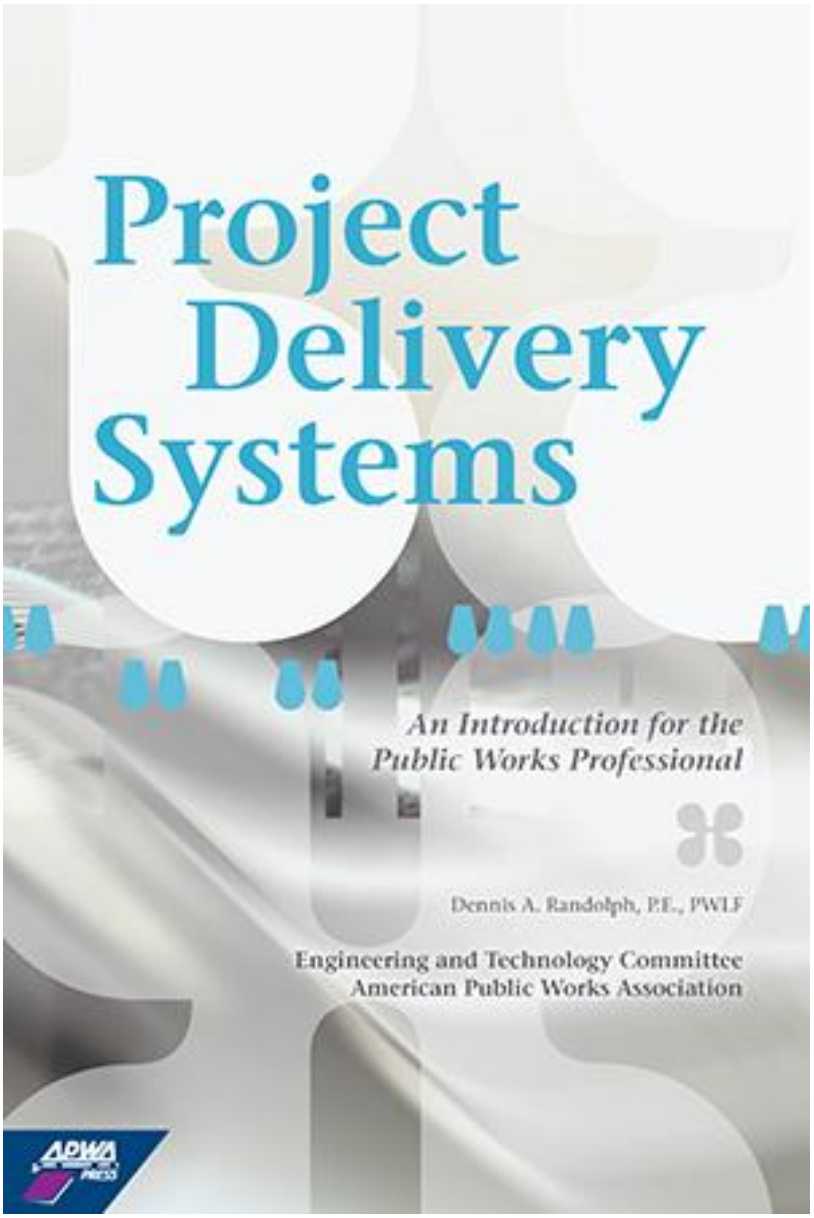
8.2. APWA Project Delivery Systems

Extract from APWA Project Delivery Systems



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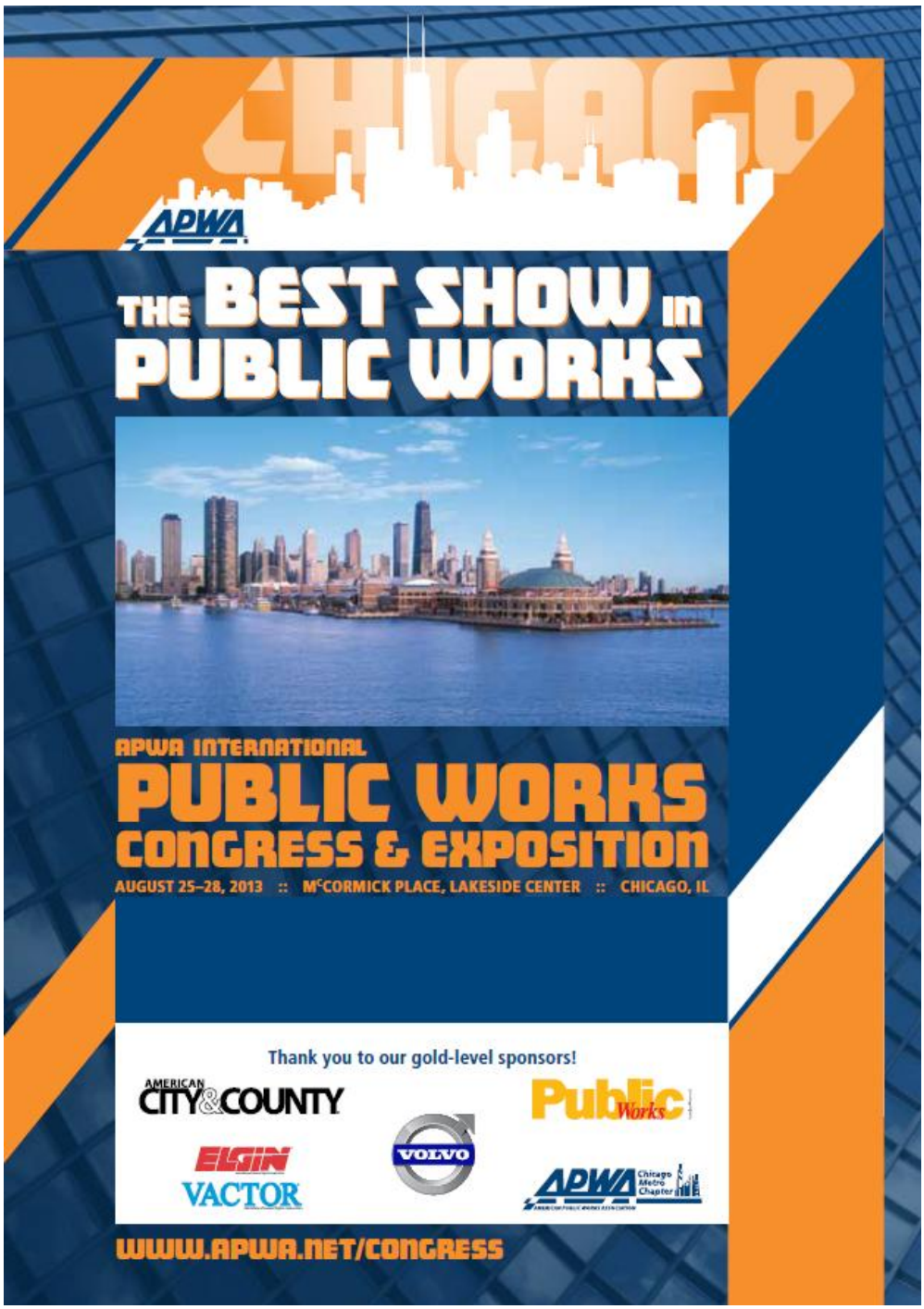
8.3. APWA - The Best Show in Public Works 25-28 August 2013

Extract from Congress program



SUNDAY

Unless otherwise noted, all activities take place at the McCormick Place, Lakeside Center.

Time	Event	Location
7–8:20 a.m.	First-Timers Meeting	E271
8:30-9:45 a.m.	Fleet Open Forum	E259
8:30–9:45 a.m.	**Education Sessions** (.1 CEU)	
	A Sustainable Building Program: BIM as a Tool for Maintenance and Operations	E253a
	Assessing Vulnerabilities of Infrastructure to Climate Change	E350
	Building Sustainable Business with Mexican Local Governments	E253b
	Ethical Yoga – How Flexible Are Your Principles	E352
	Funding-to-Construction in Four Months! Arterial Roadway Construction	E450b
	Green Streets and Porous Pavement: Lessons for Sustainability, Savings, and Success	E351
	New Tools for Your Winter Maintenance Arsenal	E353a
	Strengthen Your Workforce – Create a Formula for Success	E353b
	The Joplin Tornado Redevelopment	E353c
	Using Dirt to Improve Safety	E253cd
10 a.m.–Noon	**Opening General Session**	
	Thomas L. Friedman: That Used to Be Us: How America Fell Behind in the World It Invented and How We Can Come Back	Arie Crown Theater
Noon–4 p.m.	**Exposition Open**	Exhibit Hall D
	Lunch: Noon–3 p.m.; Non-compete Exhibit Time: Noon – 3 p.m.	
1–1:50 p.m.	**Exhibitor Solutions Theater** (.1 CEU)	
	To LED or Not To LED, Is That the Question?	Booth 153
	Implement a Comprehensive Driver Safety Solution within Public Works: Context, Technology and Organizational Support	Booth 2143
1–1:50 p.m.	**There's an APP for That!**	
	Work Order Management Apps	Booth 218
2 p.m.	Daily Prize Drawing at The Expo Experience	Booth 840
2–2:50 p.m.	**Exhibitor Solutions Theater** (.1 CEU)	
	Does Your Submarine Have a Screen Door?	Booth 153
	Making Utility Work Zones Accessible to ALL Pedestrians	Booth 2143
2–2:50 p.m.	**There's an APP for That!**	
	Webtech 511: North America's First Real-Time Roads App	Booth 218
2–2:55 p.m.	Chapter Leaders Forum	E265
3–3:50 p.m.	**Education Sessions** (.1 CEU)	
	An Innovative and Cost-Effective Stormwater Retrofit Program: The Green Infrastructure Portfolio Standard (GIPS)	E451c
	Comparative Management and Policy Analysis in a Global Context: Building Sustainable Communities	E253b
	Ethics for Public Works Leaders	E352
	Nationalized Cap and Trade Solid Waste Systems	E253cd
	Public Works: A First Responder for Traffic Incidents and All-Hazards Emergencies	E353a
	Regional Solutions Involving Groundwater Desalination and Ocean Outfall	E253a
	Report Card – America's Infrastructure Needs 2013	E350
	Retrofitting Fleet Garages to Maintain CNG/LNG Vehicles	E450b

SUNDAY

Unless otherwise noted, all activities take place at the McCormick Place, Lakeside Center.

Time	Event	Location
3–3:50 p.m. (continued)	**Education Sessions** (continued)	
	Shifting the Burden of Graffiti Abatement from Public Works to the Public: The Chicago Method	E353c
	So, You Want to Build a Downtown Train Station on an Existing Rapid Transit Line?	E353b
	Using Technology to Its Fullest Potential.	E351
	Wisconsin's First Use of a Low-Bid-Design-Build Delivery Method for the Accelerated Construction of Two Lift Bridges	E450a
3–3:50 p.m.	**Exhibitor Solutions Theater** (.1 CEU)	
	Work Order Management	Booth 153
	Save Money by Covering Your Salt and Equipment	Booth 2143
3–3:50 p.m.	**There's an APP for That!**	
	Taking Your Operations Management Systems to the Field	Booth 218
3–4:50 p.m.	**Super Session** (.2 CEUs)	
	Green Alleys and Streets – How Are They Working?	E451d
4–4:50 p.m.	Emergency Management Open Forum	E259
4–4:50 p.m.	**Education Sessions** (.1 CEU)	
	A Nation on the Move – China's National High Speed Network	E253a
	Fleet Benchmarking for Advanced Decision Making	E450b
	LEED Certified Solid Waste Facilities	E253cd
	Our Filing System Went Electronic. WE FAILED! Then We Did It the Right Way	E353c
	Practical Steps in Pursuit of Sustainability – Milwaukee County Steps Forward	E450a
	Smart Trees! Success in Growing and Protecting the Urban Forest	E351
	Snow & Ice Performance Evaluator	E352
	Sustainable Stormwater Solutions in Mature Neighborhoods – Innovative Delivery of Functional Improvements	E353b
	Village Uses Innovative Cost-Savings Approach for Reconstruction of Residential Streets.	E350
	Waste Not, Want Not: Feasible Uses, Options, and Markets for Your Wood Waste	E253b
	Water Incident Information Resource	E353a
	Watersheds Know No Political Boundaries: A Look Into the Benefits and Challenges of Watershed Permitting	E451c
5–7 p.m.	Get Acquainted Party	Soldier Field

MONDAY

Unless otherwise noted, all activities take place at the McCormick Place, Lakeside Center.

Time	Event	Location
8:30–9:45 a.m.	**General Session**	
	Speakerto be announced: A Whole New Ballgame: Chicago's Infrastructure Planning	Arie Crown Theater
10–10:50 a.m.	**Education Sessions** (.1 CEU)	
	Asset Management & Capital Planning for Underground Infrastructure	E253b
	Educate, Inspire, and Transform the Leaders of Tomorrow	E351
	Fixing Streams for Free	E353a
	Green Roof Basics and Benefits	E450a
	Partnering to Achieve Green Infrastructure Goals	E350
	Public Works Camp – "Right-This-Minute" Topics	E450b
	Sacramento's Water Loss Program Evaluation and Strategy to Control Leakage in a Cost-Effective Manner	E253a
	The Benefits of a Geographic Approach to Infrastructure Management	E253cd
	Total Resource Management – Managing All Your Assets	E353c
	Turning Successful Public and Media Involvement Campaigns into Funding	E352
	Update on Issues and Advocacy for Infrastructure in Canada	E353b
	What Employees Expect from Their Bosses – Hear Firsthand for Yourself!	E451d
10–10:50 a.m.	**Exhibitor Solutions Theater** (.1 CEU)	
	Operations Management: The Missing Piece of Your Enterprise	Booth 153
	How to Implement a GPS Tracking Solution Smoothly	Booth 2143
10–11:30 a.m.	PWHS Board of Trustees Open Discussion	E263
10 a.m.–3 p.m.	**Exposition Open**	Hall D
	Lunch: 10 a.m.–2 p.m., Non-compete Time: 11 a.m.–2 p.m.	
11–11:50 a.m.	**Exhibitor Solutions Theater** (.1 CEU)	
	High Performance Salt Pre-Wetting Agents – Your Solution to Substantially Reducing Chloride Emissions and Winter Maintenance Costs	Booth 153
	The Impact of Unwanted Vegetation on Municipal Infrastructure and Innovative Management Solutions	Booth 2143
11–11:50 a.m.	**There's an APP for That!**	
	New Paperless Technologies for Public Works	Booth 218
12–12:50 p.m.	**Exhibitor Solutions Theater** (.1 CEU)	
	Going Green with Hot-in-Place Recycling	Booth 153
	Take Control of Inflow and Infiltration in Manholes	Booth 2143
12–12:50 p.m.	**There's an APP for That!**	
	ASCE Infrastructure Report Card App: Putting Grades, State Profiles, Success Stories, and News in Your Pocket	Booth 218
12–1:30 p.m.	Canadian Public Works Association (CPWA) Luncheon	
	(Ticketed event – separate fee and preregistration required.)	E271
	Public Works Historical Society (PWHS) Luncheon	
	(Ticketed event – separate fee and preregistration required.)	E265
1–1:50 p.m.	**Exhibitor Solutions Theater** (.1 CEU)	
	Building Better Maintenance in the Cloud	Booth 153
	Low-Cost Asset Management	Booth 2143
1–1:50 a.m.	**There's an APP for That!**	
	Extending Your Workforce through Civic Engagement	Booth 218
1:15 p.m.	Daily Prize Drawing at The Expo Experience	Booth 840
2–2:50 p.m.	**Education Sessions** (.1 CEU)	
	A Grassroots Approach to Sustainable Projects While Nurturing Future Generations of Systems-Thinking Public Works Professionals	E353b
	Big Box Recycling	E253cd
	Common (and Costly) Problems in Delivery of Federal-Aid Local Transportation Projects…And How to Prevent Them	E351

MONDAY

Unless otherwise noted, all activities take place at the McCormick Place, Lakeside Center.

Time	Event	Location
2–2:50 p.m. (continued)	**Education Sessions** (continued)	
	Continuous Improvement – How the City of Ottawa Public Works Department Generated $1 Million in Annual Savings from Employee Ideas	E353a
	Monetizing Public Works Assets: Salvation or Snake Oil?	E353c
	Pavement Sustainability on Steroids: How Keyhole Technology Extends Pavement Life	E450a
	Roughing It! Rating High Speed, High-Volume Roadways	E450b
	Signs and Pavement Markings That Meet the Needs of the Driver and the MUTCD	E451d
	Tablet Application Revolutionizes Public Works Operations.	E352
	WIGS and Green Dots–Getting Organizations to Focus on What's Important	E253a
2–2:50 p.m.	**Exhibitor Solutions Theater** (.1 CEU)	
	Turning Tier 4 into a Benefit Beyond Lower Emissions.	Booth 153
	Vehicle Lift Safety and the Fleet Manager's Responsibility	Booth 2143
2–2:50 a.m.	**There's an APP for That!**	
	Improving Public Works Communication Beyond the Vehicle	Booth 218
2–4:50 p.m.	**Super Session** (.3 CEUs)	
	"Make No Little Plans"–Chicago's Epic Public Works Story	E350
2–5 p.m.	**Public Works Stormwater Summit** (.3 CEUs)	
	Public Works Stormwater Summit (Day One)	E451c
3–4:30 p.m.	Self Assessment and Accreditation Open Forum	E267
3:30–4:45 p.m.	APWA Donald C. Stone Center Awards Ceremony.	E271
3–3:50 p.m.	**Education Sessions** (.1 CEU)	
	Becoming a Master Leader – The Myron Calkins Excellence in Leadership Series Presentation	E351
	Documented Road Safety Benefits of Adaptive Traffic Signals	E352
	Evaluating the New Possibilities of Snow Logistics in a Growing Urban Environment	E353b
	Getting What You Need Out of Activity Planning and Activity-Based Costing	E253cd
	Illinois Public Works Mutual Aid Network – Responding to the Call	E450b
	Innovative Ideas and Methods of Recycling in Eastern Europe Learned Through Jennings Randolph 2013 Study	E253a
	Mega Project–Monster Management	E353c
	Retroreflectivity, Redundancy, and Replacement Using GIS to Manage Your Signs and Budget	E451d
	Turning Data into Actionable Information	E253b
	Water Conservation through Meter Technology.	E353a
4–4:50 p.m.	**Education Sessions** (.1 CEU)	
	Alternatives to Paving	E353b
	Building Sustainability into Your Infrastructure Plan: Changing the Culture of Decision Making	E351
	Driving Sustainability and Efficiency in Historic Buildings – Milwaukee City Hall Complex	E352
	How to Divert Waste Material from Going to the Landfill	E253b
	Lessons Learned from Peer Review of Public Agencies	E353a
	Pedestrian and Bicycle Design in Suburban/Rural Communities.	E353c
	Tablet Technology – Powerful Inventory and Reporting Application	E451d
	Tools to Motivate Your Millennials – From the Millennials' Perspective.	E450b
	Trees in the Pipeline Right-of-Way	E253a
5–7 p.m.	Awards and Recognition Ceremony and Reception	Arie Crown Theater
8–9:30 p.m.	Young Professionals Networking Reception	Buddy Guy's Legends

TUESDAY

Unless otherwise noted, all activities take place at the McCormick Place, Lakeside Center.

Time	Event	Location
7–8:15 a.m.	American Academy fo Environmental Engineers and Scientists (AAEES) Breakfast *(Ticketed event – separate fee and preregistration required.)*	E267
7:30–9 a.m.	Small Cities Rural Communities (SCRC) Town Hall Meeting	E271
8:30–9:45 a.m.	**Tuesday General Session** Reality-Based Leadership: Ditch the Drama and Turn Excuses into Results Speaker: Cy Wakeman, Thought Leader and Best-Selling Author	Arie Crown Theater
10–10:50 a.m.	**Education Sessions** (.1 CEU) "Beauty Pays Better Than Any Other Commodity": Industry, Leisure, and Port Development in Daniel Burnham's Chicago	E353a
	City Art Re-Imagines Saint Paul City Systems	E353b
	Collaborating to Retrofit Communities for 21st Century Weather	E351
	Customer Service You Can APP-reciate! Blending Mobile Apps, Web Requests and Technology	E253a
	Executive-Level Leadership…Are YOUth Ready??	E352
	Food and Wrapper Composting System	E253b
	Groundwater Recharge with Stormwater Management – A Sustainable Development	E450a
	MAP-21 – In the Rear View Mirror and the Road Ahead	E350
	Opportunity Is Knocking – The APWA Jennings Randolph Fellowship	E253cd
	Public Works Camp – "Right-This-Minute" Topics	E450b
	Sustainability Fueling Phoenix's Past, Present, and Future	E451d
	Toolkit for Public Works Advocacy	E353c
10–10:50 a.m.	**Exhibitor Solutions Theater** (.1 CEU) Understanding and Utilizing Bio-Based Solutions for Public Works	Booth 153
	Rubberized Asphalt Pavement Technologies	Booth 2143
10–11:30 a.m.	Diversity Brunch *(Ticketed event–separate fee and preregistration required.)*	E265
10–Noon	Chapter Website Template Training	E258
10 a.m.–2 p.m.	**Exposition Open** Non-compete Exhibit Time: 11 a.m.–2 p.m.	Hall D
11–11:50 a.m.	**Exhibitor Solutions Theater** (.1 CEU) What Is Sabotaging Our Underground Systems and How Do We Fight Back	Booth 153
	Chicago Successfully Tackles Aging Brick-and-Mortar Manhole Rehabilitation Effort	Booth 2143
11–11:50 a.m.	**There's an APP for That!** Making Place Audits by Enabling BYOD	Booth 218
12–12:50 p.m.	**Exhibitor Solutions Theater** (.1 CEU) Making Place Audits by Enabling BYOD	Booth 153
	Beyond Telematics: Using Data to Predict the Future	Booth 2143
12–12:50 p.m.	**There's an APP for That!** High Mast Long Life Options	Booth 218

TUESDAY

Unless otherwise noted, all activities take place at the McCormick Place, Lakeside Center.

Time	Event	Location
1 p.m.	Daily Prize Drawing at The Expo Experience	Booth 840
1–1:50 p.m.	**Exhibitor Solutions Theater** (.1 CEU) Urban Tree Management – Technology and Best Practices Utilizing Precast Concrete Panels and Pavement Patching	 Booth 153 Booth 2143
2–3:30 p.m.	**Education Sessions** (.15 CEU) A View from the Top – Women in Public Works Talk about Their Lives and Careers Accreditation Is for EVERYONE! Alternative Strategies for Funding Fleets and Fleet Replacement Building Values-Driven Leadership in the City of Peoria, Arizona Certified Silver or Gold – How to Navigate the Waters of Sustainability Certification Programs Chicago's Complete Streets Policy – Safe for All Users Designing and Constructing ADA-Compliant Curb Ramps. Leadership Strategies to Retain, Engage, and Motivate a Multigenerational Workforce Local and Rural Road Safety Tools Modern Methods of Sewer and Water Main Rehabs, Saving Tax Dollars	 E353c E253cd E253a E353a E350 E352 E451d E351 E353b E253b
2–4 p.m.	Chapter Treasurers and Administrators – Ask National	E264
2–4 p.m.	Public Works Institute Forum	E450b
2–4:50 p.m.	**Super Session** Reality-Based Leadership™: A Deeper Dive – Cy Wakeman	 E450a
2–5 p.m.	**Public Works Stormwater Summit** Public Works Stormwater Summit (Day Two)	 E451C
2:30–4 p.m.	MicroPAVER Pavement Management Forum	E261
3:45–5 p.m.	**Education Sessions** (.1 CEU) Benefits of High Friction Surface Treatment Chicago's Bike Program Emerald Ash Borer Program How to Innovate in Public Works Mini-Roundabouts: Design and Operation Experience in the United States. What Gets Measured Gets Done – Performance Standards for Solid Waste Management Winter and Politics Workforce Diversity: Recruiting and Retaining Minorities and the Disadvantaged Yes I See…Using Visuals through GIS and CMMS for Better Maintenance Decisions	 E353b E353a E353c E352 E451d E253cd E350 E351 E253a
Evening	Chapter Dinners	

WEDNESDAY

Unless otherwise noted, all activities take place at the McCormick Place, Lakeside Center.

Time	Event	Location
8–10:45 a.m.	APWA Business Meeting and Board of Directors Meeting.	E265
8–10:45 a.m.	Workshop/Tours *(Preregistration Required)* *All Workshop/Tours Depart from the Chicago Hilton Hotel. Be at the 8th Street entrance by 7:45 a.m. (See page 78 for details)* Tour: 130th and Torrence Avenue: The World's Largest RR Truss Bridge Move Tour: Chicago Bike Lanes and Cycle Center Tour: Chicago's Deep Tunnel Tour: Chicago's Green Roofs Tour: Jardine Water Treatment Plant Tour: Millennium Park Tree and History Tour	
8:30–9:20 a.m.	**Education Sessions** (.1 CEU) Adopting a Holistic Approach to Asset Management . . . . . E352 APWA Certifications – What Are They Really All About? . . . . . E253b Evaluating Project Risks to Improve Performance, Avoid Surprises, and Keep Your Elected Officials Happy . . . . . E351 Leveraging Advanced Metering Infrastructure to Improve Customer Service. . . . . E353a Pass-Through Financing of Public Works Projects . . . . . E350 Things That Go Bump in the Pipe: Stormwater Infrastructure Condition Rating Systems . . . . . E353b Tier 4 Engine Equipment Compliance E353c	
8:30–10:45 a.m.	**Wednesday Classroom Workshops** (.2 CEUs) Emergency Management 101: Why Should You Care?. . . . . E253a Media Relations for Public Works Professionals . . . . . E450b Trenchless Technology – The Good News Story . . . . . E253cd Water Infrastructure Sustainability Rating Using Envision™ E451d	
9:30–10:45 a.m.	**Education Sessions** (.1 CEU) A Small City's Story of Implementing a Work Order and Asset Management System . . . . . E352 An Integrated Green Infrastructure Plan to Address CSOs, Stormwater, and Nutrient Reductions . . . . . E353a Creating Livable Communities and a New Urban Fabric – Forget Those Speed Humps! . . . . . E450a Growing Up in Public Works: A Young Professional's View . . . . . E353b Integrated Infrastructure Planning: Baltimore's Integrated Planning Framework . . . . . E350 Municipal Partnering Initiative "No Municipality Is an Island" . . . . . E351 Technology for Parking Control . . . . . E353c The Gold in Conversion of 30,000 Cobra Head Street Lights to LED. E253b	
11 a.m.–12:15 p.m.	**Closing General Session** ACE: Attitude, Character, and Enthusiasm Speaker: Mike Ditka	Arie Crown Theater
12:30–4 p.m.	APWA Board of Directors Meeting.	E265

8.4. Congress exposition floor plan