

---

# People and Place

---

- creating resilient  
ecosystems

---

Clifford Overton  
Metropolitan Fire Brigade  
2012 Emergency Service  
Foundation study tour

---

## Contents

Gratitude.....	1
Executive Summary.....	2
San Francisco.....	3
NERTs .....	4
SPUR.....	8
Bringing it all together in San Francisco.....	9
Natural Hazards Workshop.....	11
Buffalo, New York .....	13
Conclusions and Next Steps.....	14

## Gratitude

I would like to thank the emergency service professionals, academics, public servants and community members across America who aided me in this study tour and who provided me with wonderful hospitality and amazing stories.

## Executive Summary

The new era of 'resilience' in emergency management policy and practice has created a flurry of activity in agencies across Australia. Concepts around what resilience means in a disaster context are still being discussed as new departments are formed and programs developed to 'build resilient communities'.

Resilience has different meanings to different people. The word implies strength in the face of adversity, flexibility in the capability to absorb damage and a capacity to effectively return to a 'normal' state.

Given the rapid adoption of the resilience concept in emergency management and its many interpretations, it is not surprising to find a plethora of programs all aimed at building resilience.

This report is based on the outcomes of a two week study tour in the United States of America in July 2012.

The purpose of the tour was to

- investigate 'best practice' in relation to integrated resilience planning in an urban environment;
- learn more about the latest in resilience research, policy direction, strategy and program development across a wide range of agencies; and
- understand the models that best describe resilience building concepts that may have an application in the Victorian Emergency Management sector.

With the experiences gained through the study tour, the ultimate aim is to influence resilience program development with a simple to understand model that describes resilience building and to bring 'key players' in resilience building to the table with emergency management agencies.

The study tour results can be summarised in the following points:

- For emergency management agencies to successfully create and maintain community resilience in relation to disaster events or other emergencies, they need to work with a wide range of stakeholders – including all government departments, the private sector and most importantly, not for profit or faith based organisations.
- There are existing concepts around quantifying resilience that use relatively simple models and these models can be applied to programs in Australia.
- Successful partnerships in resilience building rely on strong leadership at both the organisational and personal level.

In the end – a resilient 'ecosystem' would consist of resilient people who are informed and prepared, resilient places that respond to emergency events and the communities' needs in a way that mitigates impact, and resilient services that provide a coordinated response to emergency events.

## San Francisco

The study tour commenced with a series of meetings and observations in San Francisco, focussing on the government agencies integrated contributions to community resilience building.

The initial 'attraction' to San Francisco as a city with a proactive and established role in community resilience building was realised through on line research into community engagement programs aimed at building resilience.

The City and County of San Francisco has a history of major earthquakes, and as such – deals with risk management and emergency management based on the premise that a severe earthquake is likely to happen.

Given that the Federal Emergency Management Agency (FEMA) listed the top three likely catastrophic events to occur in the United State of America as a hurricane in New Orleans, a terrorist attack in New York and an earthquake in San Francisco – the residents of the City and County of San Francisco are justifiably nervous.

Fast facts about San Francisco<sup>1</sup>:

- Land area - 121 square kilometres, situated on the northern end of the San Francisco peninsula.
- Population – 805,225 as of the last census in 2010.
- April 18<sup>th</sup>, 1906 – a magnitude 7.9 earthquake struck San Francisco and northern California. The earthquake and subsequent fire destroyed 80% of the city and killed over 3,000 people.
- October 17<sup>th</sup>, 1989 – a magnitude 6.9 earthquake known as 'Loma Prieta' killed 63 people, injured 3,757 and left thousands homeless.

Whilst the focus may be on earthquake as the 'next big disaster' to impact on San Francisco, this focus has provided multiple benefits across all hazards/all agencies response to any type of major event.

An earthquake produces not one, but several cascading emergency events – building collapse, fire, flood, vehicle accidents, hazardous material incidents, pollution, disease outbreak, civil unrest, etc – therefore by planning for an earthquake, San Francisco is planning for everything.

---

<sup>1</sup> Fast Facts: [http://en.wikipedia.org/wiki/1906\\_San\\_Francisco\\_earthquake](http://en.wikipedia.org/wiki/1906_San_Francisco_earthquake)

## NERTs

San Francisco risk focusses on the potentially catastrophic earthquake that could destroy the city, therefore much of the emergency services infrastructure; response planning and community engagement has focussed on this risk. This focus has enabled the San Francisco Fire Department to engage with their community through the Neighbourhood Emergency Response Team (NERT) program<sup>2</sup>.

The NERT program was initiated following the Loma Prieta earthquake, as a means of better equipping the community for the potential impact and immediate aftermath of a similar event, so that community members function in a support role to emergency services in disasters – rather than as victims of the disaster. One positive outcome of the Loma Prieta earthquake were the efforts made by community members to support the laying of fire hose lines across damaged streets from the fire boats to a major fire in the city.

The NERT program mission statement reads:

“Beginning with ourselves, we will be prepared and work as an individual or together as emergency response teams to assist our families and neighbours in time of disaster and to be prepared to make decisions that do *The Most Good For The Most People*”<sup>3</sup>

The underlying premise of the NERT program is that a major disaster will overwhelm first responders leaving many community members on their own for the first 72 hours or longer after the emergency.

The NERT program focusses on four basic goals for the community

1. Prepare your family and home to survive
2. Protect yourself first so that you will be able to help others
3. Assist family and neighbours during time of disaster
4. Work as part of an emergency response team

These goals are based on a sort of ‘social radius’ where as you achieve the first goal you are equipped to expand your radius to provide support at the next goal.

Since 1990, the NERT program has provided training in all hazards emergency response to over 20,000 members of the community. Even if these 20,000 people only ever looked after their own welfare in a disaster that would be a significant achievement, if all 20,000 then went on to look after their neighbourhoods and work together in teams – the NERT program will have delivered a powerful community resilience outcome.

---

<sup>2</sup> NERT program: <http://www.sf-fire.org/index.aspx?page=859>

<sup>3</sup> About NERT: <http://www.sf-fire.org/index.aspx?page=875>

Whilst in San Francisco, I was fortunate to be shown around the city and the NERT program by Lieutenant Erica Arteseros of the San Francisco Fire Department. Erica is responsible for the management of the NERT program and provided me with insights into the programs evolution – as well as opportunities to attend NERT training during my visit.

One particular training event clearly demonstrated to me the power and reach of the San Francisco NERT program. On a windy Wednesday night in San Francisco, over seventy local community members turned out to a local church hall for their second last night of NERT training.

On this night, they were all introduced to the concept of AIMS and the idea that – as small community teams – they could manage local incidents, assess the risks, provide basic medical support and communicate their situation to response authorities.

I sat and watched these people, aging in range from young adult to retiree, form small teams and set about gathering information and providing support in an earthquake scenario. The power of these people in the room to make decisions and take action in relation to their own safety was palpable, no-one shied away from the challenge and everyone wanted to succeed.



*A San Francisco NERT Incident Management Team.*

I also met Bonnie.



*Bonnie – America’s latest super hero.*

Bonnie personifies the NERT program. To meet Bonnie during a major emergency - who is all of about five foot tall and who would probably blow away in the winds outside that night – you would place Bonnie into the ‘victim’ category.

But in fact, Bonnie is ‘America’s latest super hero’. In a country in love with a long and growing list of mythical heroes with special powers, often immortalised in comic books and a never ending run of movie remakes – Bonnie stands proud.

So what makes Bonnie a super hero?

1. Bonnie has already completed NERT training, and was here on the night for refresher training. Bonnie's first special power is that she remains engaged in the process and returns for more.
2. Bonnie spoke to me about her experiences with the NERT training and her expectations of her own abilities – should an emergency that requires them occur. Bonnie's second special power is knowledge of her own capacity to respond in a disaster.
3. Bonnie also spoke to me about the NERT training and the networks she has built in her neighbourhood as a result. She has made friends through the program and they meet regularly for NERT related or other activities. Bonnie's third special power is that Bonnie is part of a larger community network that supports each other.
4. Bonnie and I discussed the NERT program and the San Francisco Fire Department. Bonnie understands the challenges that emergency services would face in a large scale emergency in the city, and Bonnie is ready to support her fire department. Bonnie's fourth special power is that she understands her role in the partnership with emergency services.
5. Bonnie wears her tabard, hard hat and ID badge with pride – as her super hero costume. The NERT ID badge is issued after NERT training. This ID registers the trainee and as a qualified NERT, provides them with a level of indemnity against prosecution for any reasonable action they may undertake in a disaster response role as a NERT. Bonnie's fifth special power is protection awarded to her by the City and County of San Francisco.

These superhero special powers may not be as amazing as X-ray vision, or flying – but remember, Bonnie is only one of 20,000 other NERT super heroes with the same powers. The San Francisco Fire Department NERT program continues to improve the resilience of San Francisco citizens through training, engagement, skills maintenance and networking.

I consider the San Francisco NERT program to be an excellent example of 'best practice' community resilience building. It does rely on an ever present threat to motivate and engage with the community, but in doing so – it delivers so much more that the community can learn from and apply in their daily lives.

In the ten years that the NERT program has been running it has not remained stagnant. It has evolved to meet community needs and responded to technology change as new communication and engagement opportunities arose.

The success of the NERT program is influencing the development of similar programs across USA and in other locations (such as Christchurch post-earthquake). I have every faith that if an earthquake ever does strike San Francisco, many of its citizens are well prepared, well equipped and will work together with their emergency services as a result of the efforts of the San Francisco Fire Department.



## SPUR

As part of the San Francisco leg of the study tour, I met with two members of the San Francisco Planning and Urban Research (SPUR) centre, Mr David Bonowitz and Mr Chris Poland. SPUR functions as a member supported, non-profit organisation and has existed in San Francisco in one form or another since a group of young city leaders came together to improve the quality of housing after the 1906 earthquake and fire.

SPUR provides support for land use, investment and transport strategies across San Francisco, and works closely with government departments on land use planning strategy and policy. SPUR also provides a forum for community members to become involved in land use planning proposals.

SPUR is also heavily involved disaster planning and creating a resilient city, through activities such as the comprehensive retrofitting of buildings and infrastructure in the city, to harden it against the potential impact of an earthquake. The SPUR goal is to 'Make our cities truly resilient by taking steps now to help them remain safe and usable after a major earthquake'.

The SPUR Resilient City program<sup>4</sup> has prepared a series of reports investigating the culture of preparedness in San Francisco communities, the condition of existing infrastructure to withstand an earthquake, the priorities for upgrades in 'lifelines' in and out of the city, and the need for policy change in relation to future built form.

The SPUR Resilient City program is comprehensive, in that it

- involves the full PPRR continuum;
- investigates community attitudes, expectations, culture and capacity;
- engages with community, private sector and government; and
- utilises the best knowledge from practitioners across the country.

My meeting with David Bonowitz and Chris Poland explored the role of a not for profit organisation such as SPUR in the creation of resilient places. Whilst I have not explored other cities in America to see if organisations such as SPUR are commonplace, the concept of a not for profit professional body that provides the community with a voice and advocates governments for change on behalf of the community – would sit well in Melbourne.

I believe that there is a role for the Planning Institute of Australia or some other professional body in providing leadership in disaster planning and in the creation of a 'resilient Melbourne' program.

---

<sup>4</sup> SPUR Resilient City <http://www.spur.org/initiative/resilient-city>

## Bringing it all together in San Francisco

There is an abundance of work underway in San Francisco aimed at improving the city in relation to its people, its buildings and its infrastructure in preparation for the earthquake everyone expects.

The greatest challenge is in integrating this work.

The City and county of San Francisco is fortunate to have a government who took the lead on this challenge and through policy change, mandated the production of an integrated Community Safety element for the General Plan for San Francisco<sup>5</sup>. The General Plan for San Francisco is an integrated strategy for the future development of the city for the attainment of the following goals:

- Protection, preservation, and enhancement of the economic, social, cultural, and aesthetic values that establish the desirable quality and unique character of the city.
- Improvement of the city as a place for living, by aiding in making it more healthful, safe, pleasant, and satisfying, with housing representing good standards for all residents and by providing adequate open spaces and appropriate community facilities.
- Improvement of the city as a place for commerce and industry by making it more efficient, orderly, and satisfactory for the production, exchange and distribution of goods and services, with adequate space for each type of economic activity and improved facilities for the loading and movement of goods.
- Coordination of the varied pattern of land use with public and semi-public service facilities required for efficient functioning of the city, and for the convenience and well-being of its residents, workers, and visitors.
- Coordination of the varied pattern of land use with circulation routes and facilities required for the efficient movement of people and goods within the city, and to and from the city.
- Coordination of the growth and development of the city with the growth and development of adjoining cities and counties and of the San Francisco Bay Region.

The Community Safety element<sup>6</sup> incorporates community preparedness, land use, building performance, emergency response, social and economic recovery and reconstruction following an emergency event. The Community element sets objectives, policies and direction for all government services, emergency services, and community and not for profit groups with a role in planning for, responding to and recovering from emergencies.

---

<sup>5</sup> The General Plan for San Francisco [http://www.sf-planning.org/ftp/general\\_plan/index.htm](http://www.sf-planning.org/ftp/general_plan/index.htm)

<sup>6</sup> The Community Safety Element  
[http://www.sf-planning.org/ftp/General\\_Plan/Community\\_Safety\\_Element\\_2012.pdf](http://www.sf-planning.org/ftp/General_Plan/Community_Safety_Element_2012.pdf)

This comprehensive document does (once again) focus on earthquake as the most likely major emergency event to impact the city, but it also investigates flooding as a result of reservoir failure or tsunami.

Having met with many 'players' in the land use planning and emergency management space in San Francisco, one consistent element stood out in the many conversations, they have a shared plan and they understand their role in making the plan work.

I believe that is something to aspire to here in Melbourne.

Finally, I concluded the first leg of my study tour in San Francisco with the captain and crew of the two fireboats based at station 35, and then prepared for the next part of my journey.



*Sixty years old and still going strong.*

## Natural Hazards Workshop

The 37th Annual Natural Hazards Workshop was held in Broomfield Colorado, offering thirty concurrent sessions across five themes over three days. This workshop brought researchers and practitioners together from across the globe, and provided an excellent opportunity to hear on recent findings, current issues, new policy and future directions in emergency management.

The keynote speaker, David Kaufman, (Director of FEMA's Office of Policy and Program Analysis) spoke on the future of emergency management in an increasingly fragile and complex world. David Kaufman's presentation outlined some of the key challenges facing the emergency service sector across the world:

- **Technology.** Our society is building an increasing dependence upon technological support for daily life. For example – ATM's require Global Positioning to operate, without satellites we could not withdraw cash from an ATM.
- **Global interdependencies.** The Japan tsunami impacted on US car manufacture and energy policy in Germany. If the volcanic eruption in Iceland had continued for three days longer, it would have crippled several major international businesses.
- **Health.** The H1Ni virus was the fastest moving virus in history; fortunately it was a relatively low impact virus.
- **Economy.** 44% of the world's top economies are businesses, not countries. Wal-Mart's GDP is greater than Saudi Arabia's.
- **Food.** The average grocery store has three days supply of food on hand. Three companies control the supermarket supply to 50% of the USA. The supermarket supply system operates on stock signals from outlets as purchases are made, to alert the suppliers to the need to send new stock. In an emergency event, the supply signal 'goes dark' with a loss of power and new stock is diverted to other locations – right at the point when the food supply to a disaster impacted area becomes more critical.

These are some of the issues that the emergency management sector faces in the future, and the research work underway by FEMA in indicates that emergency events are increasing in complexity and decreasing in predictability. David Kaufman spoke of the imperative to build trust with communities, that this is not a governmental challenge – but a societal challenge.

David Kaufman also spoke about the fact that in most emergencies, community members are the first responders and that in the recovery phase, communities that led their own recovery, recovered faster. These are important issues to consider if we are to create new spaces for new communities to live and work in.

The work that David Kaufman and his team at FEMA are producing in relation to the future of the emergency management sector and the issues it will face - is work that we in Australia will need to learn from, and consider in relation to our own future.

One of the most enjoyable and engaging presenters at the Natural Hazards Workshop was Mayor Bob Dixon from the City of Greensburg, Kansas. Bob Dixon spoke passionately about the impact of the tornado that touched down through the city more than 75 times on 4 May 2007, killing eleven people and destroying 90% of the city – and the subsequent recovery and rebuilding process, based on the vision ‘Rebuilding – stronger, better, greener’.



*Greensburg after the tornado.*

The key leaders in the City of Greensburg found themselves in the position of being able to rebuild in a way that improved community resilience, sustainability and liveability. Out of the disaster an opportunity arose – to create a new model green community. This ‘building back green’ initiative was supported by the U.S. Department of Energy and the National Renewable Energy Laboratory. With the support of federal agencies, the local community leaders and community groups were able to plan and build in a way that encouraged best practice in building construction, energy use, transport and new employment opportunities in green businesses.

Mayor Bob is a ‘larger than life’ character with a passion for his community and a great pride in the results of the community led, government supported Greensburg rebuilding process. Mayor Bob’s presentation and enthusiasm illustrated the role of leadership in creating both resilient communities and resilient places – in this case the opportunity arose from disaster, but the role of strong leadership and community involvement in the process would apply in the same way to any new site proposed for development.

Mayor Bob and I became firm friends during the conference and I look forward to visiting Greensburg one day to see for myself the results of the community rebuilding process.

## Buffalo, New York

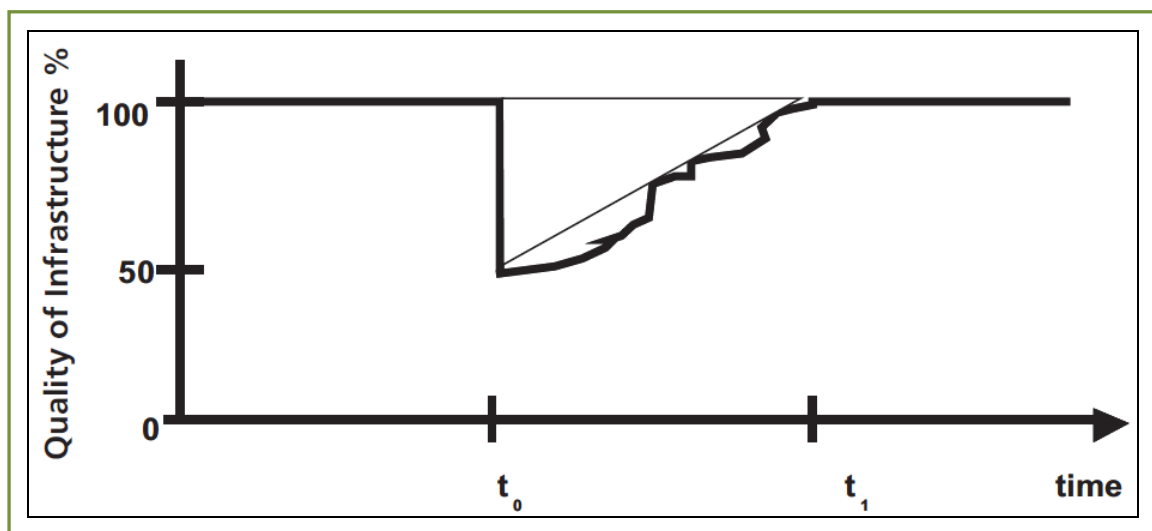
The final leg of the study tour took me to Buffalo, New York – where I met with Professor Andrew Whitaker at the University of Buffalo. The reason for my visit was to understand the theory behind conceptualising and measuring resilience, discussed in a paper written by Kathleen Tierney and Michel Bruneau<sup>7</sup> in 2007, for the Multidisciplinary Centre for Earthquake Engineering and Research (MCEER) at the University of Buffalo.

The paper proposes an 'R4' framework for conceptualising resilience, based on:

- Robustness – the ability to withstand the impact of an event.
- Redundancy – the ability to substitute services or systems for affected ones.
- Resourcefulness – the capacity to diagnose, prioritise and provide support
- Rapidity – the capacity to restore functionality in a timely way.

The paper also poses a method of quantifying resilience in relation to the R4 framework, and the purpose of my meeting with Professor Whitaker was to discuss and fully understand the quantifying method.

The diagram below illustrates what is known as the 'resilience triangle' where the time taken for infrastructure (whether that be physical or social) to return to the condition it was in (back to 100% quality of infrastructure) before it was impacted by an emergency event.



*The resilience triangle (Tierney and Bruneau).*

<sup>7</sup> Tierney and Bruneau (2007) [http://onlinepubs.trb.org/onlinepubs/trnews/trnews250\\_p14-17.pdf](http://onlinepubs.trb.org/onlinepubs/trnews/trnews250_p14-17.pdf)

My meeting with Professor Whittaker took me through the process of defining resilience using the R4 model, and how the triangle works in relation to the four R's. The full diagram becomes a 3 axis model when redundancy is considered, but I find the simple diagram as shown above as an easy way to 'illustrate' resilience. I have tested the diagram with emergency service staff on a number of occasions by posing the question 'can you draw what resilience looks like?' I then draw the diagram and explain the process. For many people – the understanding that 'resilience is how hard it hurts and how long you take to get better' comes from the diagram.

I have taken the diagram one step further and drafted a script for a simple animation, where a stick figure falls down a hole (the depth of the impact on infrastructure) and then has to dig their way out (the time taken to recover). I intend to pursue this animation concept further, as a tool for illustrating resilience to the broader community.

Whilst the long trip to Buffalo for one meeting with one expert may have initially seemed an extraordinary effort for information, the reward has outweighed the cost.

## Conclusions and Next Steps

As previously discussed –the sharing of the resilience triangle and the opportunity to broaden its audience through other methods of communication is already underway. The design and production of a 'YouTube' hosted animation titled 'resilience – what's it all about?' is one project I plan to see through in time for the 2013 ESF conference.

As far as the lessons learned in relation to coordinating land use planning and development agencies with emergency management agencies in the creation of integrated plans for resilient places – that work is also underway.

In October 2012, the Victorian State Government released a discussion paper titled "Melbourne, let's talk about the future'. This discussion paper calls for responses on the issues around how we create a safer, sustainable city in the future. The opportunity to take my learnings from the study tour now exists, and as a result – MFB is coordinating a three agency response (MFB, CFA and SES) to the discussion paper.

Joint emergency management agency meetings with government planning departments have also occurred. MFB and SES met with the Department of Planning and Community and Development and Growth Areas Authority to discuss integrated emergency management and land use planning in October 2012, with an aim to keep meeting and develop processes to support integrated planning.

I am confident that the knowledge I gained through the ESF study tour will be applied at various levels throughout the emergency management sector, as well as the government agencies responsible for land use planning and development, and I look forward to my involvement in this area as the good work continues.