IPWEA
Institute of Public Works Engineering Australia

# International Study Tour

# Road Safety
# An International Perspective

Chris Champion, Doug Bradbrook, Daryl Collins, Graham Bilton, Dave Harris, Rod Kennedy, Angelo Catinari, Geoff Metcalfe, David Abbott & Mark Varmalis

Institute of Public Works Engineering Australia

SHIRE of YARRA RANGES

Report prepared by Mark Varmalis

Sponsored by the Municipal Engineering Foundation Victoria and Yarra Ranges Shire Council

Study Tour Report prepared by Mark Varmalis, Manager Civil Development Services, Shire of Yarra Ranges

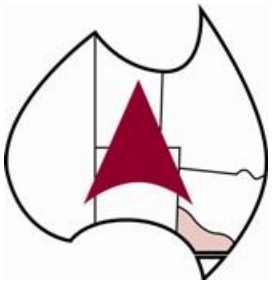
March 2007

The views expressed in this report are the views of the author.

Appreciation is expressed to the Municipal Engineering Foundation Victoria for sponsoring the study tour and to the Yarra Ranges Shire Council for endorsing my participation on the tour.

Thanks to our hosts in the US and Netherlands who ensured that our tour was a valuable learning experience and to the visited authorities and staff who contributed their time to outline the roles and functions of their organisations.

Special thanks to Chris Champion (IPWEA National CEO) for coordination of the tour and to David Abbott (IPWEA National President 2006), Doug Bradbrook, Graham Bilton, Angelo Catinari, Daryl Collins, Dave Harris, Rod Kennedy & Geoff Metcalfe for their fine company on the tour.



Institute of Public Works Engineering Australia

SHIRE of YARRA RANGES

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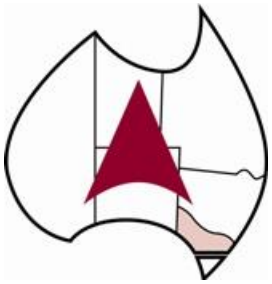

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# Executive Summary

The Institute of Public Works Engineering Australia National Study Tour 2006 had the theme of "Public Works and the Community" and travelled to North America, United Kingdom and the Netherlands. The study tour was coordinated by the National Office of IPWEA and occurred over the period of Sunday 3 September to Thursday 21 September 2006.

It was my objective through participation in the national study tour to broaden my knowledge of international road safety practices, thus providing me with greater credibility in advocating for improved road safety changes as opportunities arise both as a representative of Local Government on the VicRoads Speed Limit Advisory Group, as an active member of the Institute of Public Works Engineering Australia, and in day-to-day initiatives and actions associated with my role at the Shire of Yarra Ranges.

The focus of this study tour was to draw comparison with the United States, United Kingdom and the Netherlands arrangements in the areas of:

- levels of accountability and authority provided to Local Government in relation to road safety and speed limits;
- relationship between government levels with regard to road safety, from a Local Government perspective;
- speed limit frameworks and their relationship to road environment and condition;
- local initiatives undertaken to achieve improved road safety and their effectiveness; and
- opportunities for further enhancement of road safety from a Local Government perspective.

## Study Tour Visits

Over the 18 day period of the study tour, 12 host organisations were visited in addition to attending the APWA International Public Works Conference and Exposition. Following the conclusion of the official tour, I chose to continue viewing issues of interest independently in the United Kingdom, touring Ireland, Scotland and England.

Whilst in San Francisco, the study tour visited the City of San Leandro, Metropolitan Transport Commission, Caltrans and Panoramic Interests. In Chicago, the study tour met with Larry Lux and the Chicago Metropolitan Agency for Planning. The study tour then progressed to Kansas City to attend the APWA International Public Works Conference and Exposition and visit with the Kansas City Downtown Redevelopment Project and Cordish Developments. After a weekend stopover in London where the tour group observed issues of interest, the group travelled to the Netherlands where we were hosted by the Municipality of Zaandam, SWOV, Ministry of Transport and Works, Regional Organisation of ROV-ZH and the Municipality of Almere.

In all locations, observations were made of road safety practices and initiatives. Initiatives and opportunities that could be translated to the Victorian and Australian system that were observed and are considered to have been effective include:

- minimum speed limits for motorways and highways;
- road pavement chevron markers to indicate to drivers a safe following distance when travelling at high speed;
- intelligent transport systems;
    - variable speed limits for motorways and highways,
    - changeable message signs for providing information to the driver, and
    - in-car driver information systems.
- road pavement text markings;
- repeat advanced warning signs with distance information;
- count down timer for pedestrian crossings;

- road safety training programs;
- in lane rumble bars;
- high visibility speed cameras;
- use of speed cameras in road construction zones;
- separated bicycle facilities;
- strategic road safety planning;
- education programs focused on road safety;
- slow vehicles using left lane compliance;
- township speed zone threshold treatments;
- solar raised reflected pavement markers; and
- pedestrians crossing traffic signals in all directions at the same time.

## APWA International Public Works Congress and Exposition

While in Kansas City, the study tour participants attended the 2006 APWA International Public Works Congress and Exposition, held in the Kansas City Convention Centre. Over 7,000 delegates attended the four-day conference which included over 150 education sessions covering 16 themes, conference first time attendee events, over 430 conference exhibitors, a selection of technical tours, and nightly functions that allowed networking and discussion with conference attendees. The Congress catered for wide-ranging interests in public works, with the sessions generally very professionally presented with a high standard of information. The technical tours were also of considerable interest.

## Road Safety Observations

From my observations and material I have researched in the United Kingdom, United States and Netherlands for this report, Australian road safety practices compare favourably with initiatives in these countries.

Whilst local knowledge and familiarisation with Victorian conditions may have an influence, it is considered that on balance road safety arrangements in Victoria are at a comparatively high standard. The data collected for OECD countries demonstrates Victoria to be in the company of world leaders in road safety standards.

The framework for road management and road safety in Australia is led by the State Government, however it is considered that Local Government is best placed to recognise and advocate on local issues. The direct contact that Local Government has with the community allows quality interaction to occur so as to gain a good understanding and assessment of issues, and consequently deliver high quality and relevant initiatives.

The role Local Government can play in contributing to road safety initiatives includes:

- A focus on addressing issues at the local community level;
- Ensuring that local issues are understood at a State level;
- Advocating for change where statewide systems do not fully respond to local issues;
- Development of local strategies and initiatives to respond to local road safety issues;
- Interacting and networking with counterparts in other municipalities at a regional level;
- Providing feedback to the State on local issues;
- Active participation in State and industry reference groups and forums; and
- Lobbying for State and Federal funding for addressing local issues.

As an outcome of the study tour, a number of recommendations are proposed relating to pedestrian crossings, intelligent transport systems, on-road and roadside treatments, traffic cameras, heavy vehicles, bicycle facilities, relationships between Local and State Governments, community engagement, leadership initiatives for Local Government, and leadership initiatives for IPWEA.

## Conclusion

The experience of participating in the 2007 International Study Tour was extremely valuable and educational.

The road safety initiatives and observations made during the course of the study tour has provided me with a broader perspective and increased knowledge for responding to road safety challenges, which will be utilised in my day to day position as well as in advocacy and representative roles that I currently participate in on behalf of the IPWEA and Local Government.

Appreciation is again expressed to the Municipal Engineering Foundation Victoria for their sponsorship of the study tour.

Mark Varmalis
Manager Civil Development Services
Shire of Yarra Ranges

March 2007

# 1 Introduction

The Institute of Public Works Engineering Australia National Study Tour 2006 had the theme of "Public Works and the Community" and travelled to North America, United Kingdom and the Netherlands. The study tour was coordinated by the National Office of IPWEA and occurred over the period of Sunday 3 September to Thursday 21 September 2006.

There were 10 participants on the study tour from New South Wales, Queensland, South Australia, Victoria and Western Australia who were supported by either their State Municipal Engineering Foundation or local municipality.

The study tour was led by Chris Champion - National CEO of IPWEA. The tour was also joined by David Abbott - National President of IPWEA.

I was fortunate to receive an award from the Municipal Engineering Foundation Victoria to participate in the study tour, which is greatly appreciated.

In addition to the National theme for the study tour, the Municipal Engineering Foundation Victoria sought participants with a focus for road safety.

I currently represent LGPro/IPWEA as the Local Government delegate on the VicRoads Speed Limit Advisory Group. My input to this committee since June 2003 has been limited to the knowledge I have of Victorian, and to a lesser extent interstate arrangements. It was my objective through participation in the national study tour to broaden my knowledge of international road safety practices, thus providing me with greater credibility in advocating for improved road safety changes as opportunities arise both as a representative of Local Government on the VicRoads Speed Limit Advisory Group, as an active member of the Institute of Public Works Engineering Australia, and in day-to-day initiatives and actions associated with my role at the Shire of Yarra Ranges.

I have also committed to endeavour to share this knowledge with my colleagues in Local Government through the various Local Government networks that I participate in and through industry forums and seminars that occur.

The opportunity to participate in the 2006 National Study Tour exceeded my expectations. The study tour provided experiences that cannot be gained through reading literature, research through the internet, or attending forums to hear speakers on topics of interest. The value in meeting with international colleagues, to hear and see examples of issues from their perspective first-hand, and to discuss and seek further information on issues has provided me with a quality experience that will be forever valued.

I would also like to acknowledge the hospitality and time that was shared by those that the study tour members met with, which was extremely generous and was greatly appreciated.

In addition to these experiences, there was also the value of sharing interests and issues with the other study tour participants, all of whom contributed towards this study tour being successful and most enjoyable.

# 2 Study Tour Focus

Within Victoria the road management and safety framework is determined by VicRoads, being the State road authority. Discussions often occur between local and state representatives on issues relating to traffic management and road safety, generally on the basis of approval being sought from VicRoads for local authorities to undertake local initiatives or action.

VicRoads endeavours to delegate responsibility where possible, to enable and empower local authorities to implement actions. Actions however generally must be consistent with a statewide framework.

State legislation also empowers local authorities to undertake actions, however certain powers can only be implemented after approval has been granted by VicRoads.

Internationally, Local Government has varying levels of influence and authority in determining and implementing initiatives related to road management and safety.

The focus of this study tour was to draw comparison with the United States, United Kingdom and the Netherlands arrangements in the areas of:

- levels of accountability and authority provided to Local Government in relation to road safety and speed limits;
- relationship between government levels with regard to road safety, from a Local Government perspective;
- speed limit frameworks and their relationship to road environment and condition;
- local initiatives undertaken to achieve improved road safety and their effectiveness; and
- opportunities for further enhancement of road safety from a Local Government perspective.

# 3 Study Tour Visits

## 3.1 Overview

The study tour had the national theme of "Public Works and the Community" with participants from New South Wales, Queensland, South Australia, Victoria and Western Australia.

The study tour group members were from a range of engineering and executive management backgrounds, from urban and rural municipalities and had varied interests.

In preparing for the study tour, the participants gathered to make contact with and organise visits to host organisations in the various destinations of the tour.

As a result of the varied interests of the group, the study tour visits were diverse and with varying focus. The information provided by the host organisations varied, while sometimes focusing on some of the study tour theme issues more so than others, depending upon the expertise of the various presenters. The presentations provided however were extremely informative and greatly valued, broadening perspectives of all participants of the study tour group.

The study group's areas of interest included:

**Urban Growth & Renewal**

- Creating communities and sense of place;
- Engaging with communities; and
- Integrating transport solutions.

**Road Safety & Local Government**

- Road environment, speed & communities;
- Initiatives at a local level; and
- Role & relationships with other levels of government.

**Community Infrastructure**

- Asset management planning & systems;
- Works program management & prioritisation; and
- Measuring performance & community satisfaction.

**Organisational**

- Employer of choice initiatives (retaining & recruiting staff);
- Disaster management (business continuity & risk); and
- E-government and use of technology in public works.

Study Tour participants are listed in Appendix 1.

## 3.2 Study Tour Itinerary

The study tour occurred over the period of Sunday 3 September to Thursday 21 September 2006, visiting North America, United Kingdom and the Netherlands.

Visits occurred with 12 host organisations over this 18 day period.

Whilst the official tour concluded on Thursday 21 September, I chose to continue viewing issues of interest independently in the United Kingdom, touring Ireland, Scotland and England.

The study tour schedule is shown in greater detail as Appendix 2, and is summarised as follows:

**San Francisco (3 – 6 Sept)**

- City of San Leandro;
- Metropolitan Transport Commission;
- Caltrans; and
- Panoramic Interests, Berkeley.

**Chicago (7 – 8 Sept)**

- Larry Lux – consultant; and
- Chicago Metropolitan Agency for Planning.

**Kansas City (9 – 14 Sept)**

- APWA International Public Works Conference and Exposition;
- Kansas City Downtown Redevelopment Project; and
- Cordish Developments.

**London (15 – 17 Sept)**

- General viewing of the city.

**Netherlands (18 – 20 Sept)**

- Zaandam;
- SWOV;
- Ministry of Transport & Works;
- Regional Organisation of ROV-ZH; and
- Municipality of Almere.

**End of official tour (21 Sept)**

**United Kingdom (22 Sept – 7 Oct)**

- Return to independently tour Ireland, Scotland and England.

## 3.3 San Francisco, California

The City and County of San Francisco is located on the west coast of North America, with a population of 798,680 (2006 estimate) is California's fourth largest city and the 14th most populous city in the United States. (http://en.wikipedia.org)

### 3.3.1 City of San Leandro

#### General

The City of San Leandro is 48 km southwest of San Francisco, has an area of 24 sq kms and population of 80,000. The City is supported by a number of major employers in retail and industry, generating a daily population increase of 20,000 who travel to work from outside the city borders.

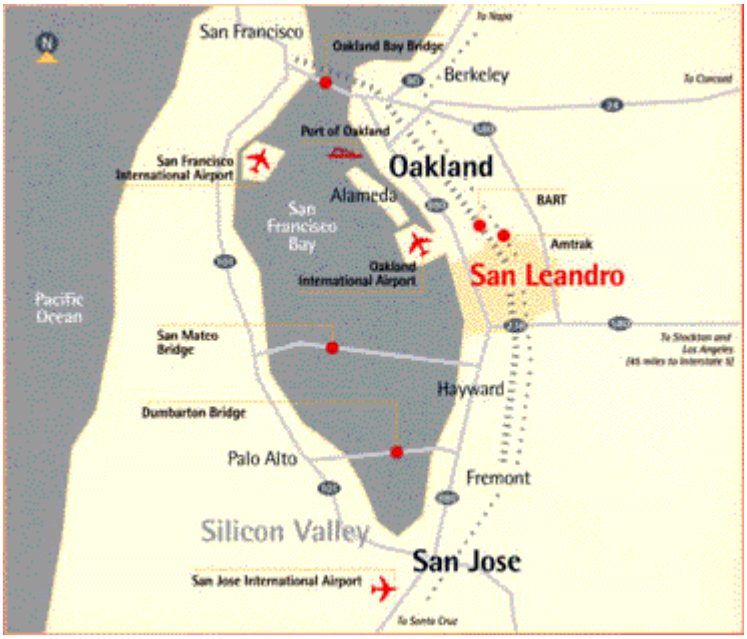



*Image City of San Leandro*

#### Presentations

The study tour group was provided with presentations that outlined the following:

- Overview of the Municipality
  - Population growth since 1872 to current day, with the boom years of post 1950.
  - Demographic change from a largely white population to one that is now far more ethnically diverse.
  - Organisational structure and responsibilities, comprising police, schools, fire brigade. This highlighted duplication of key services between municipalities.
  - Revenue sources of the City - property taxes and other taxes that are raised to generate income to meet needs for an overall expenditure budget of $109 million.
- San Leandro General Plan
  - Land use, municipal goals and policies projected 15 years into the future.
  - Economic development initiatives to attract business and grow employment.
  - Smart growth principles of sustainable development, transit priorities, downtown redevelopment, mixed housing use, high-density living.
  - Downtown redevelopment projects, higher density living, streetscape transformation, industry redevelopment, transportation integration, renovation of parks and open space, and the incorporation of urban design principles.

- Bay Area Rapid Transport System (BART)
  - Overview of BART, a high standard, highly efficient and reliable rail service serving the San Francisco bay area, including the cities of San Francisco, Fremont, Oakland, Berkeley, Richmond, Pittsburg/Bay Point, Dublin/Pleasanton, San Francisco airport and Millbrae.
  - BART is administered by its own government established authority, governed by an elected board of directors representing nine geographic areas within the district.
  - Development of an integrated transport system, with the city supplementing bus services to connect with the BART service.
  - Involvement with redevelopment adjacent to modal centres with higher density living.

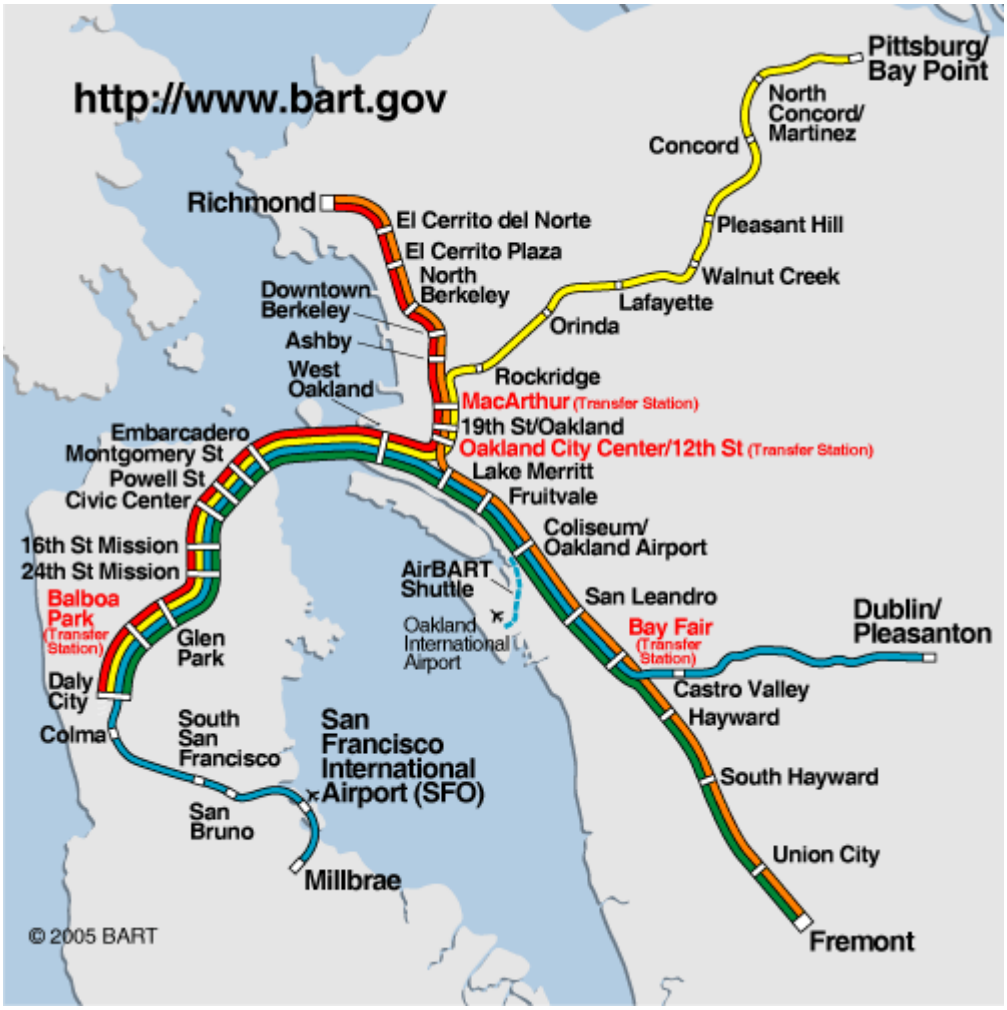



*Image BART*

- Tour of the municipal offices and works depot.
  - Demonstration of CCTV system for monitoring of intersections and traffic signals.
- Tour of the city's sewage treatment facility.

Reference for further information www.ci.san-leandro.ca.us & www.bart.gov

## Road Safety Initiatives and Observations

CCTV monitoring system

Engineering and transportation staff have established a CCTV system for monitoring of a limited number of local intersections. Due to limited resources, the system is not constantly monitored. Staff however have used the system for traffic planning, safety improvements and enhancement of phasing times for traffic signals at the intersection. The system has also been used to assist with local policing issues.

Whilst this level of technology can provide efficiency gains for addressing issues at the immediate locations where CCTV infrastructure has been installed, the initial capital and ongoing maintenance costs have restricted the ability to expand the technology across the municipality. We were advised that the benefit cost ratio of investing and upgrading this standard of technology is not often affordable at a Local Government level.


*Photo Geoff Metcalfe*

Pedestrian crossings

Pedestrian crossings in many locations were provided with the feature of a count down timer that advised pedestrians of the remaining period available to cross an intersection. Generally the phasing for pedestrians included a "green time" indicated by the symbol of a walking man, followed by a digital count down of the remaining time in seconds to cross the road. The digital count down was in red text with the count down period varying for different locations, generally depending upon the size of the intersection. The red phase was indicated by the symbol of a red hand.

The count down innovation provides pedestrians with the knowledge of the time remaining for crossing the road, and my observation was that generally pedestrians adhered to these controls.

Interestingly, whilst tactile pavers were generally installed audible indicators were rarely provided to assist vision impaired pedestrians.


## 3.3.2 Metropolitan Transport Commission

### General

The Metropolitan Transportation Commission (MTC) is the transportation planning, coordinating and financing agency for the San Francisco Bay area. It functions as both the regional transportation planning agency and as the region's metropolitan planning organisation for its nine counties and 101 municipalities. Approximately 7 million people reside within its area of responsibility of 7,000 square miles.

The MTC does not have the authority over municipalities within its region in the same way that the state government planning authorities have over Local Government in Australia, as municipalities in the USA are incorporated bodies with their own constitutional powers. The authority therefore relies on the allocation of grant funding to these municipalities as a means of gaining their cooperation and participation in planning decisions.

The MTC is empowered by state and federal laws to raise its necessary funding through a range of taxes and transport tolls.

### Presentations

The study group was provided with presentations that outlined the following:

- Overview of the Metropolitan Transportation Commission;
  - Roles and responsibilities,
  - Authority with an integrated transport focus,
  - Services authority for freeways and expressways, and
  - Bay area toll authority.
- Transportation for liveable communities;
  - Transportation land use policy adopted in 1996,
  - Policy that links integrated transport investments with community design and land use decisions,

    - Focus on Smart Growth, high-density living around transport nodes,
    - Support for neighbourhood revitalisation and place making,
    - Capital grant incentive program to encourage municipalities to align with regional planning decisions, and
    - Housing incentive program encouraging high-density development near existing transit nodes.
- Street and road infrastructure maintenance needs;
    - StreetSaver - MTC pavement management system,
    - Adoption of the system by all bar one of the municipalities in the region, and
    - Allocation of funding for asset maintenance to municipalities is based on comparative needs.
- TransLink - universal smartcard system;
    - Single smartcard for access to all transport modes (bus, ferry, commuter rail, subway), and
    - Partnership with Motorola and ERG (based in Perth, Australia).
- Vehicle Infrastructure Integration, which is under development through a public-private partnership;
    - Establishment of vehicle-to-vehicle and vehicle-to-roadside communication system, transmitted through a vehicle's on board navigation/information system,
    - Safety benefits - collision avoidance, violation warning, kerb warning, weather information, road surface data,
    - Mobility benefits - traveller information, ramp metering, traffic signal optimisation, electronic tolls, construction zones, pavement conditions, and
    - Not intended to be an enforcement tool, which has been highlighted to encourage public acceptance.

Reference for further information www.mtc.ca.gov

## Road Safety Initiatives and Observations

Vehicle Infrastructure Integration System

The Vehicle Infrastructure Integration system initiative is an Intelligent Transport System that increases the safety and mobility for motorists.

Intelligent Transport Systems may in the future be developed to an extent where the task of driving can be fully automated, as exists in the aviation and rail transport industries. This will provide significant safety gains by removing the variations of human behaviour and abilities from the road transport system. For this to be achieved however will require immense advancement in the overall management of the road network, transforming it into a robotic type system. Complete automation of vehicles on the road network would provide a near absolute safe environment for all users.

The MTC Vehicle Infrastructure Integration system allows for the provision of vehicle-to-vehicle and vehicle-to-roadside communication. The system links with an on board car computer that interprets and responds to information received. The system allows for the car computer to intervene and avoid collisions, assess the appropriate speed for travelling around sharp curves, assess the road condition during wet weather, and reduce speed where the driver may be exceeding the posted speed limit.

The system will also assist with mobility needs of the driver, by providing information on travelling conditions for the proposed route, allowing the driver to consider alternate routes.

The system is not intended to be used for enforcement purposes, as this would effect adoption of the system by motorists. It would however be reasonable to expect that into the future as Intelligent Transport Systems become commonplace, that the system would be robust and appropriately regulated and supported to ensure safety objectives are achieved.

Transportation Strategy

The Metropolitan Transportation Commission has developed a transportation strategy - "Mobility for the Next Generation - Transportation 2030 Plan for the San Francisco Bay Area" which identifies a number of strategic directions for the region. The safety initiatives listed within the strategy briefly discussed below.

- Safe and Well Maintained Systems - which focuses upon the reduction of injuries and fatalities for all modes of transport, preparation for future transportation emergencies resulting from natural disasters and security threats, reduction of long-term transportation repair costs, and saving consumers repair costs due to poor or road conditions.
- High Occupancy Vehicle (HOV) lanes - are identified as improving the efficiency of the freeway system, encouraging motorists to car pool. The establishment of HOV lanes provide a time-saving of up to 20 minutes for motorists. Expansion of the HOV lane network around the bay area is planned for the future, and will be funded through tolling.
- Regional Bicycle Plan - recognises the need for providing improved and safer facilities for cyclists and pedestrians. Over 1500 miles of bicycle paths are proposed in conjunction with improved pedestrian facilities (footpaths, pedestrian signals, pedestrian crossings, perambulator crossings, etc). Prioritisation of projects will focus on improved access to transit nodes, schools and regional activity centres, therefore addressing areas of greatest safety risk.

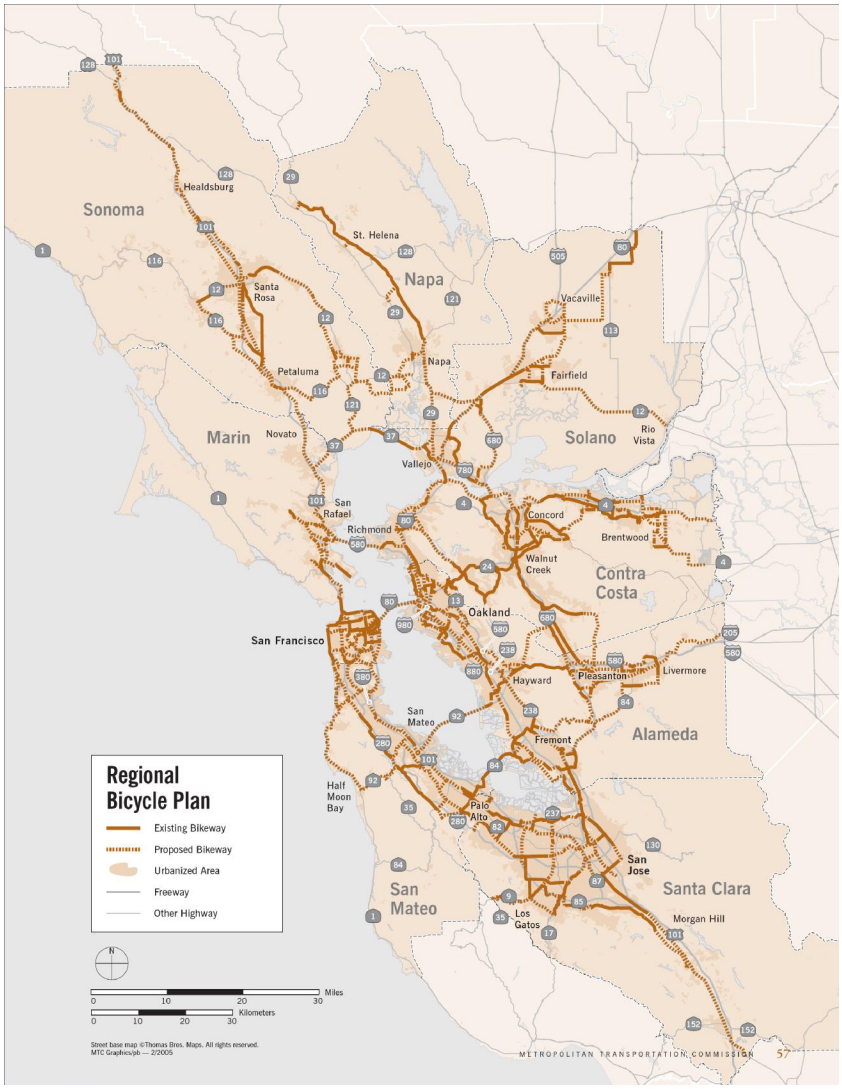



*Image Metropolitan Transportation Commission*

## 3.3.3 Caltrans

### General

Caltrans (California Department of Transportation) is the state transport authority responsible for in excess of 45,000 miles of California's highway and freeway system, inter-city rail services, public use airports, and special use hospital heliports.

### Presentations

The study group was provided with presentations that outlined the following:

- 511 driver information system;
  - A free phone and web service that provides information on Bay Area transportation,
  - Transit - interactive service to help plan trips utilising public transport, including schedules, routes, maps and fares,
  - Traffic - information including driving times between destinations, traffic conditions and incidents,
  - Rideshare - car pooling and ride matching service,
  - Bicycling - bicycle maps and information, bicycle organisations, cycling tips,
  - BikeMapper - service to find bike paths, bike lanes and major transit stations throughout the Bay Area, and
  - My511 - personalised information for repeated use of the site.

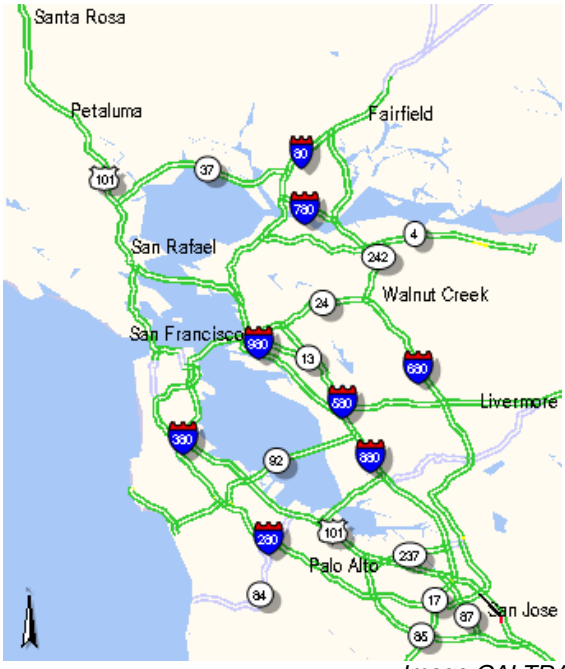



*Image CALTRANS*

- Tour of Transportation Management Centre;
  - Coordination of highway and traffic management on the state system,
  - Traffic monitoring, traffic management operations, incident management, traveller information services, coordination of response activities amongst various agencies,
  - Approximately 1,027 CCTV monitoring systems are in place along the state highway network, and
  - Approximately 100 overhead Changeable Message Signs that are used to provide critical real-time traffic advisory information to motorists.

Reference for further information www.dot.ca.gov

### Road Safety Initiatives and Observations

511 Driver Information System

The 511 driver information system initiative is a component of an Intelligent Transport System that increases the safety and mobility for motorists. The 511 driver information system is incorporated within the Metropolitan Transportation Authority's Vehicle Infrastructure Integration system (described above).

The system assists road safety by providing information to the motorist of transportation related issues that may affect a planned trip, such as delays associated with road works, road accidents, and other related information. Based upon the information provided, drivers can select the optimum route for reaching their destination and be informed of the expected time for the trip. Feedback from customers identifies that 20 percent of trips are changed as a result of information provided by the 511 service.

Changeable message signs

The Transportation Management Centre at CALTRANS monitors and coordinates traffic on the bay area highway system utilising CCTV monitoring systems. Real time information is provided to motorists on overhead changeable message signs, allowing motorists to respond to issues ahead. Road safety and delay warning messages are communicated to motorists allowing drivers to be better informed and respond appropriately to issues.

## 3.3.4 Panoramic Interests, Berkeley

### General

Panoramic Interests is an infill development company located in Berkeley, California, specialising in mid-rise, mixed use infill housing. The company has been developing housing, live-work space, and commercial space in the City of Berkeley since 1989. The company focuses on vacant and under utilised properties that are located near major bus and rail transit lines. This encourages tenants to utilise alternative transportation modes, with less than one third of tenants owning a car. Panoramic Management leases and maintains the properties developed by Panoramic Interests.

### Presentations

The study group was provided with a presentation that outlined the following:

- Local developments by Panoramic Interests;
  - Overview of planning process to facilitate redevelopment projects.
- Tour of local developments;
  - Viewing of high density residential developments,
  - Viewing of facilities associated with developments, including rooftop gardens, high-speed Internet access, common areas, recreational areas, entertainment areas, and
  - Viewing of innovative car parking garage.

Reference for further information www.panoramicinterests.com

# 3.4 Chicago, Illinois

The City of Chicago is located in the Midwest of North America on the south western shore of Lake Michigan, with a population of 2.9 million (2005 estimate) is third most populous city in the United States. The Chicago metropolitan area has a population of over 9.4 million. (http://en.wikipedia.org)

## 3.4.1 Larry Lux – Lux Advisors Ltd (consultant)

### General

Lux Advisors provide emergency management consultation for public works departments. The company also undertakes emergency management training for the Federal Emergency Management Agency and is a member of the Illinois Terrorism Task Force, a group of agencies and individuals that devise strategies for disaster preparation.

Lux Advisors acted as a host upon arriving at Chicago and presented on emergency management, making comparisons between Australia and the USA.

## 3.4.2 Chicago Metropolitan Agency for Planning

### General

The Chicago Metropolitan Agency for Planning (CMAP) was established in 2005 by the State of Illinois to better integrate planning for land use and transportation. The Agency is an amalgam of the Northeastern Illinois Planning Commission and the Chicago Area Transportation Study. The regional agency serves seven counties and 279 municipalities that make up the third largest US metropolitan region.

### Presentations

The study group was provided with presentations that outlined the following:

- Overview of Chicago Metropolitan Agency for Planning;
  - Organisation composition and governance framework,
  - Regional planning agency for 279 municipalities in addition to numerous schools, park and sanitary districts, and other agencies,
  - Comprehensive planning for transportation, environmental and natural resources, housing, economic development, and human services,
  - Development of the 2040 Regional Framework Plan,
  - Planning to house an additional 2 million people (current population 8 million) in the region by 2030, ensuring transportation, water, air quality, land resources, open space are effectively planned for,
  - Integration of economic development in land use and transportation plans,
  - Strategic assessment business development to ensure sustainable employment within the region,
  - Focus on protecting natural resources - 75 miles of Lake Michigan shoreline, 280+ square miles of protected open space, 138+ square miles of wetlands, 1200+ square miles of farmland, and
  - Illinois Water Supply Initiative - a comprehensive statewide framework to manage water resources.
- Chicago Area Transportation Study;
  - Strategic regional transportation plan for the year 2030, and
  - Assessment of transportation challenges and possible solutions, with recommendations on investing to improve future transportation.

- Northeastern Illinois regional greenways and trails plan;
  - Strategic development of integrated recreational trails and natural environment connections adjacent to waterways, shorelines, wetlands, former railway corridors and other key routes throughout the region, and
  - Acquisition of access rights over private land,
  - Encouragement of stewardship by the community for protecting waterways and the environment.
- Northeastern Illinois regional water trail plan;
  - Regional plan adopted in 1999,
  - Vision for a safe coordinated system of trails for non-motorised boating,
  - 500 miles of trails on 10 major waterways, and
  - Tourism, economic, environmental education and stewardship benefits associated with the project.
- Chicago wilderness biodiversity recovery plan;
  - Partnership project with the Chicago wilderness to identify strategic direction for achieving the sustainability of the region's biodiversity.
- Chicago Region Environmental and Transportation Efficiency Program;
  - Partnership between the City of Chicago, Metra, Illinois Department of Transportation and the freight rail industry to develop an integrated transport plan,
  - Community infrastructure including streets for residential connectivity, bike ways, sidewalks and transit corridors,
  - Integration of road-based travel, pedestrian and cycle travel, urban rapid transit, suburban commuter rail and the bus system,
  - Works to address accidents and injuries at 25 existing at-grade crossings, and
  - Economic efficiencies through improved integration and streamlining of services.

Reference for further information www.chicagoareaplanning.org

## Road Safety Initiatives and Observations

Grade separation projects

The Chicago Region Environmental and Transportation Efficiency includes an initiative to invest $1.5 billion focusing on railway corridors. Proposed works include 25 new roadway underpasses or overpasses to separate vehicle and pedestrian traffic from a railroad. In addition to efficiency gains on the railway network, increased public safety will be achieved by eliminating accidents and injuries at these crossing locations. Additional benefits include a reduction in vehicle emissions from being delayed at rail crossings and a reduction in noise from idling or slow-moving trains travelling through rail crossings.

Strategic focus on safety

The 2030 Regional Transport Plan for Northeastern Illinois acknowledges the regulated aspects of transportation safety and security and supports additional strategies for developing a safer transportation system, particularly in support of improving awareness and education regarding bicycle and pedestrian safety at the community level.

Strategies include:

- Separation of conflicting modes where high traffic volumes exist;
- Provision for safe pedestrian and bicycle use in the design of arterial roads;
- Attention to correcting and avoiding hazards created by vehicular traffic in community settings and on shared-use facilities; and
- Special attention to ensuring the safety of children, seniors and persons with disabilities while using or adjacent to transportation facilities.

Provision for pedestrians in streetscape works

The US Access Board has released draft Public Rights of Way Accessibility Guidelines that outline accessibility guidelines for footpaths, street crossings and related pedestrian facilities. To provide pedestrians with a safe environment in the vicinity of streetscape works, the guidelines require the provision of same-side (where feasible) temporary pedestrian routes through or past footpath or roadway construction. This provision is intended to discourage the use of opposite-side facilities, due to the occurrence of pedestrian accidents while crossing the street. In particular provision is to be made for pedestrians with visual impairments.

The guidelines also require

- pedestrian activated signals for each segment of each cross walk, including splitter islands, where pedestrian crossings are to be provided for multi-lane roundabouts,
- "Accessible Pedestrian Signals" – pedestrian signals that cater for disabilities, incorporating audible and vibrotactile indications of the walk interval for pedestrians signals to assist the visually impaired.

  Vibrotactile Accessible Pedestrian Signals consist of a vibrating surface to alert visually impaired pedestrians as to when the walk signal is green. Either the pedestrian pushbutton or the arrow on the pushbutton vibrates. Audible indicators assist in identifying the location of the pushbutton for the visually impaired pedestrian. The need for vibrotactile indicators in conjunction with audible indicators is to assist visually impaired pedestrians where traffic light pedestals are adjacent to each other for different traffic directions, and there may be some confusion for the pedestrian as to which direction can be crossed due to the overlapping sound produced by audible indicators in the traffic light pedestals.

  Accessible Pedestrian Signals have been used as a standard in Victoria for many years. The technology has been advanced such that the audible indicator monitors background noise and adjusts its volume accordingly. This is to aid visually impaired pedestrians in high traffic areas and avoids disruption to neighbouring properties in later hours of the evening when traffic conditions are minimal and hence background noise is low.

Reference for further information www.apwa.net & www.access-board.gov

## 3.5 Kansas City, Missouri

The City of Kansas City is located in the Midwest of North America, with a population of 445,000 (2005 estimate) is the seventh largest city in the Midwest. (http://en.wikipedia.org)

Kansas City was the location for the 2006 APWA International Public Works Congress and Exposition, held in the Kansas City Convention Centre. Over 7,000 delegates attended the four-day conference which included over 150 education sessions covering 16 themes, conference first time attendee events, over 430 conference exhibitors, a selection of technical tours, and nightly functions that allowed networking and discussion with conference attendees.

### 3.5.1 APWA Conference

In addition to attending the general sessions, I attended the following education sessions:

- Australia: Lessons to be learned from our friends down under;
- Public Works training for safer roads & streets - Its no accident!
- Communicating your public works image;
- Recruiting the best people for the job;
- Improve business performance through project management education;
- Leader-Manager: Is there a difference?
- SAFTEA-LU: one year later; and
- An international crisis: Recruitment and retention of public works staff.

These sessions provided me with a broader perspective of international issues associated with public works, which were of interest to my study tour topic and my day to day work life.

I also attended the technical tour visit to the City of Lenexa, which provided an overview of stormwater management from an urban area into a 35 acre lake situated in 240 acres of parkland, water sensitive urban design initiatives, and the viewing of a stream restoration project.

As a representative of IPWEA, there was also the need for representing the Institute at a promotions stand over the period of the conference. This provided an opportunity to interact with conference attendees and added to the enjoyment of the conference.

#### Road Safety Initiatives and Observations

Roadway safety training and products

The American Traffic Safety Services Association - Roadway Safety Training Institute has a focus on providing quality road safety education and training to the public works industry. The institute believes that communication, education and training will become the supporting pillars for decreasing fatalities that occur in road work zones every year. The institute provides a comprehensive programme of training courses, (such as traffic control, barrier systems installation, pavement marking, power line safety and many other programs), and an extensive library of manuals, handbooks and videos on work zone and road safety operations.

Reference for further information www.atssa.com

In-lane rumble bars

Flint Trading Inc promoted their product of preformed thermoplastic transverse rumble bars. The transverse rumble bars create an audible and vibratory warning to drivers. The rumble bars are recommended for high incident areas, such as approaches to railway crossings, work zones, toll facilities, hazardous curves, and high-speed intersections with sight restrictions. The manufacturer recommends that the rumble bars be utilised in conjunction with warning signage and pavement markings to highlight the hazard ahead.


*Photo Flint Trading Inc*

*Photo Flint Trading Inc*

*Photo Flint Trading Inc*

Reference for further information www.flinttrading.com

Traffic signal visibility

A number of US States have undertaken a focussed program on replacing existing incandescent globes within traffic signals to LED signals. In addition to improving signal conspicuousness, the LED signals reduce energy consumption by approximately 85%, reduce replacement frequency from biannual to five years for red and 10 years for green and yellow LEDs, increased reliability (less failures), and improve luminance efficiency. The California Energy Commission has offered loans and grants to local agencies to assist with these conversions.

Traffic signal conspicuousness has also been improved with an innovation known as a "Red T Display", used most extensively in California. The display consists of the conventional red-yellow-green signal head but displays two red lanterns rather than one at the top of the signals. This arrangement has been used at intersections with high-speed approaches, with reports of a 35% reduction in right-angle crashes.

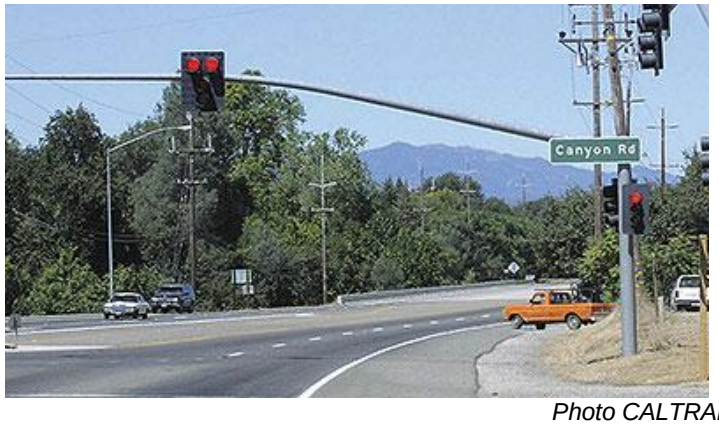



*Photo CALTRANS*

Some US states have adopted a policy requiring traffic signals above each travel lane. The object is to increase the conspicuousness of the traffic signals for drivers by placing the signals within the prominent field of view, above the travelling lane.

*Photo Iowa DOT*

Reference for further information www.atssa.com & www.tfhrc.gov

Pavement markings

As a supplement to roadside signage, on road pavement markings are considered to raise driver awareness of upcoming hazards. Pavement markings may include symbols or text on the pavement directly in the driver's line of sight. Trials by the Texas Transportation Institute resulted in a 3% speed reduction on the approach to a curve on a rural two lane roadway where the text "CURVE 55 MPH" was marked on the pavement. Before and after data has shown a reduction from 385 to only 28 wrong way movements where lane direction arrows were marked on the pavement at the end of a freeway exit ramp.

The benefit of pavement markings comes at a low cost, however ongoing maintenance is required, similar to other line marking.


*Photo Texas Transportation Institute & ATSSA*

Reference for further information www.atssa.com & www.tfhrc.gov

Speed limit signage

In a number of states throughout the US, minimum speed limits may be posted. These are normally limited to interstate highways and freeways. A minimum speed limit is established based upon engineering and traffic investigation and has the objective of maintaining traffic mobility. Slower vehicles are required to utilise the right lane.


State speed limits generally range from 75 mph (80 mph exists in some west Texas counties) to 65 mph. Speed limits are also established for trucks (generally 55 to 65 mph) and night-time travel (generally 65 mph).

Reference for further information http://en.wikipedia.org/

## 3.5.2 Kansas City Downtown Redevelopment Project

### General

As a result of a decline of the downtown area of Kansas City, a focused effort is under way to redevelop and reinvigorate the downtown precinct.

### Presentations

The study group was provided with a presentation of the Kansas City Downtown Redevelopment Project, a $3.3 billion redevelopment of the deteriorated city centre.

The objectives of the project are to create strong downtown development and management entities, create an improved community district, establish more and better downtown events, improve information and marketing services, identify parking locations and establish funding strategies to achieve improvements, and a focus on continued residential development.

An overview was provided of significant investment projects and developments, including the redevelopment of former post office for the Internal Revenue Service, Kansas City Central Library project, Downtown Sprint Centre Arena, H & R Block world headquarters, convention centre upgrade, performing arts centre, and entertainment precinct.

The increase in residential population in the downtown area has increased from zero in 2000 to 16,000 in 2006, with further increased growth projected.

A "Clean and Safe" team of 20 staff has been established to ensure the city centre is tidy at all times.

Reference for further information www.thinkkc.com

## 3.5.3 Cordish Developments

### General

Cordish Developments are a major developer involved in the Kansas City Downtown Redevelopment Project.

### Presentations

The study group was provided with a presentation of the development of the entertainment precinct of the Kansas City Downtown Redevelopment Project, valued at $850 million (US).

The entertainment precinct encompasses;

- nine square blocks of restaurants, clubs, retail and office space,
- redevelopment of two existing theatre complexes,
- condominium and hotel development, and
- supermarket and shopping facilities complex.

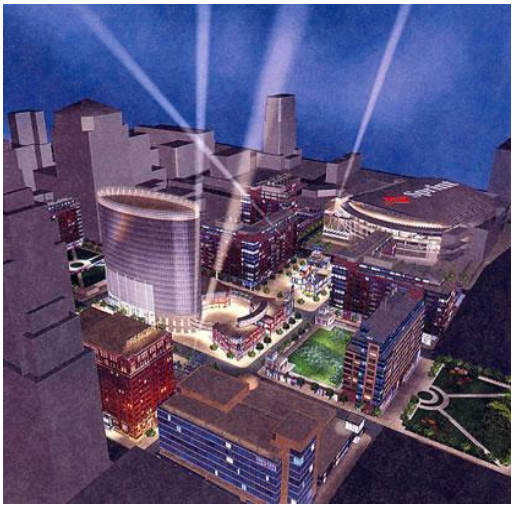


*Image Cordish Developments*

## 3.5.4 USA Governance anecdote

During the course of meeting and interacting with organisations who hosted the study tour, comments were made on a number of occasions regarding the numbers of municipalities and other forms of government in various regions.

As a result of enquiries to establish the overall number of government bodies within the USA, the APWA president – Bill Verkest provided the following information:

| | |
|---|---|
| • Federal | 1 |
| • State | 50 |
| • County | 3,034 |
| • Municipal | 19,429 |
| • Town or Township | 16,504 |
| • School District | 13,506 |
| • Special Purpose | 35,052 |
| • **TOTAL** | **87,576** |

Special purpose districts include utilities, fire, police, libraries, etc.

Of this total, Illinois leads the nation with 6,904 units of government.

# 3.6 London

Whilst there were no official visits arranged for the London leg of the study tour, there was an opportunity for viewing of the city and visiting of areas of interest related to the study tour topic.

## Road Safety Initiatives and Observations

Speed cameras

Throughout England and Wales there are in excess of 6000 speed cameras.

The Department for Transport has issued guidelines (DfT Circular 01/2007 - Use of Speed and Red-Light Cameras for Traffic Enforcement: Guidance on Deployment, Visibility and Signing) outlining the purpose and installation requirements for speed cameras.

The Department considers that;

> *"Safety cameras provide a valuable and cost-effective method of preventing, detecting and enforcing speed and traffic light offences. They encourage changed driver behaviour and are also proven to make a significant contribution to improving road safety for all users. Safety cameras therefore play an important role in an integrated road safety strategy."*

The Department encourages the establishment of local road safety partnerships to facilitate better 'meshing' between safety cameras and wider operations of traffic management, road safety, policing, and other local functions.

Safety cameras include:

- Fixed speed camera sites - used at sites where collisions are clustered around a particular point location;
- Mobile speed camera sites - used at sites where collisions are scattered along the length of road or where enforcement is needed at specific times of the day or year. This type of enforcement can also be used to compliment fixed enforcement;
- Average (point to point) speed camera sites (fixed) - this type of enforcement has the effect of calming speed over a longer distance and can be used at sites were a significant number of collisions are scattered along a length of road in for major road works enforcement; and
- Red-light or combined red-light / speed cameras - used at traffic light intersections where collisions are recorded because of vehicles failing to comply with a red traffic light.

Local authorities, the police and other local stakeholders are encouraged to work closely together to identify the top priorities for improving road safety in an area, including enforcement activity, and agreement of a joint strategy which determines the respective roles of the partners within the strategy. Safety cameras are one of the wide range of measures that are effective in reducing vehicles speeds and casualties. The local partners are expected to work together to decide the most suitable approach to safety problems at specific locations, depending upon the evidence and local needs.

The local partnership is fully accountable for these decisions and is required to be proactive in communicating information on the deployment of cameras.

The police are responsible for operating and maintaining safety cameras, and for initiating follow-up procedures to deal with offences detected.

Site selection criteria for safety cameras have been established, which lists the justification requirements for the location, its accident history, traffic speed data, site conditions for maintenance purposes, and suitability of the site for camera enforcement.

The department also considers that compliance with temporary speed limits and road work sites is extremely important to protect both the travelling public and the workforce undertaking the road works and recommends the use of temporary safety cameras at all major road works.

Fixed speed cameras are generally highly visible due to advance warning signs and bright painting of the speed camera housing.

As part of the National Safety Camera Programme, signing visibility and conspicuity rules are mandatory for speed cameras. The rules do not apply to red light cameras, as it is considered that the traffic signals in themselves are sufficient warning for drivers.

Warning signage, depicting a camera, is to be co-located with speed limit signage such that both signs are visible at the same time to a driver. Speed camera warning signage must be placed within 1 km of the speed camera.

Both speed camera housings and mobile speed camera vehicles are required to be highly visible at a minimum of 60 metres where the speed limit is 40 mph or less, or 100 metres for all other speed limits.

Fixed speed camera housings should be coloured yellow, with retro-reflecting sheeting to be used in areas without street lighting. Cameras in 'beauty spots' can remain grey. Mobile speed camera vehicles should be clearly identifiable and apparent to approaching traffic.

Importantly however, the above requirements relating to signing, visibility and conspicuity have no bearing on the enforcement of offences. Non compliance with these requirements does not provide any mitigation of, or defense for, an alleged offence.

To respond to public perception, the Department encourages quality communication with the public, providing information on location of camera sites, criteria and justification for installation of cameras, and local serious injury accident information.


*Image Telegraph*


*Image Dorset Safety Camera Partnership*


Reference for further information www.dft.gov.uk

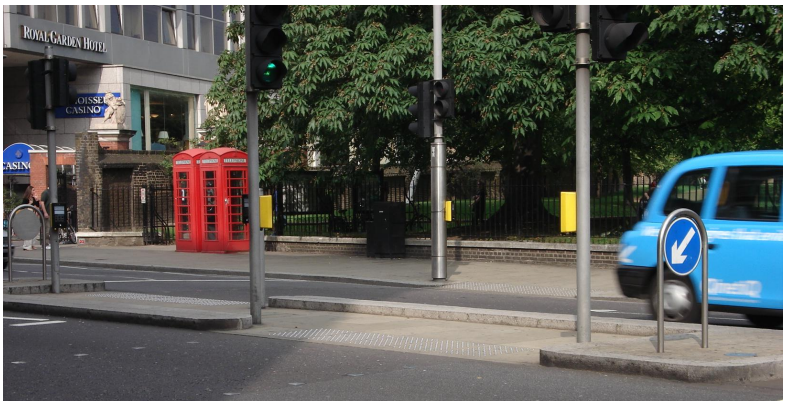
Road pavement markings

Road pavement markings are used extensively throughout the UK. In addition to directional and text information, coloured pavements are also utilised to highlight aspects such as bus stops, bicycle lanes and other restricted areas.

Vehicles are right-hand drive throughout the UK. Due to the use of the opposite side of the road (left-hand drive) in Europe, there is the need to raise awareness for foreign pedestrians of the direction from which traffic will be approaching at intersections. Similarly, pavement arrows are utilised to reinforce to drivers the correct side of the road upon which they should be driving. These pavement arrows are used particularly in areas such as in the vicinity of airports and regional tourist areas.


Pedestrian crossings

To improve accessibility for pedestrians, pedestrian crossings have been improved by removing raised areas. Use of ground tactiles for vision impaired pedestrians is incorporated. Fencing has been removed to improve driver vision of the presence of pedestrians and to remove visual clutter from the centre of the road.




It is understood that the success of this initiative is currently being monitored.

# 3.7 Netherlands

The Netherlands is a constitutional monarchy, located in western Europe. The country has a population of 16.5 million (2006 estimate) and an area of 41,500 square kilometres. The study tour visited areas and organisations in the vicinity of Amsterdam. (http://en.wikipedia.org)

## 3.7.1 Zaanstad

### General

Zaanstad is a municipality in the province of North Holland, located in the Netherlands' west. The municipality has a population of 139,500 (2005 estimate) and an area of 81 square kilometres. Unfortunately meetings organised did not proceed, and therefore the study tour visited sites within the region hosted by a representative of the municipality.

### Presentations

The study group was provided with a hosted tour of the area:

- Visit to the dikes and reclaimed areas of the region; and
- Visit to local villages where issues of interest were viewed.

### Road Safety Initiatives and Observations

Bicycle facilities

The provision of quality bicycle facilities was highly evident when travelling through the Netherlands.

The population of 16.3 million, relies upon 6.9 million cars, 13 million bicycles and 0.5 million mopeds for travel, in addition to the public transport network.

Through cities, towns and villages, cyclists are generally provided with dedicated bicycle lanes. The bicycle lanes may be within the road formation, separated from vehicle and pedestrian traffic by kerbs, or separated from vehicle traffic as a shared path with pedestrians.


At signalised intersections, traffic signals include phasing for crossing by cyclists, separated from pedestrians crossing the intersection.

Substantial facilities exist for parking of bicycles at railway stations, shopping precincts, schools and other key destinations.

Many people throughout the country own more than one bicycle. It is common practice for commuters travelling to work to cycle from home to the railway station, where their bicycle is then left, travel to their next destination by rail, collect their other bicycle and cycle to work. The journey is repeated in reverse in the evenings. For this reason bicycles are often parked in their hundreds at railway stations and other nodes. For weekends, many people also have a higher standard bicycle for recreational use.

Cyclists are not required to wear a bicycle helmet, which is acknowledged as an opportunity to reduce serious injury and fatality accidents.

In accordance with the Netherlands Sustainable Safety approach, separation of vulnerable users, i.e. pedestrians and cyclists, from vehicle traffic increases safety. Despite increasing use of cycling, cyclist fatalities have reduced from 239 in 1996 to 180 in 2004. Serious injury accidents have however remained in the range of 7000 (1996) to 7730 (2003). The total number of serious injury and fatality accidents is tabulated as follows;

| | Serious injury accident | | | Fatality accident | | |
|---|---|---|---|---|---|---|
| | 1996 | 2003 | 2004 | 1996 | 2003 | 2004 |
| Pedestrians | 1,600 | 1,230 | not known | 132 | 107 | 77 |
| *Cyclists* | *7,000* | *7,730* | | *239* | *219* | *180* |
| Mopeds | 3,000 | 2,900 | | 102 | 99 | 87 |
| Motorcycles | 1,360 | 1,280 | | 94 | 96 | 91 |
| Car or Van Occupant | 6,230 | 5,320 | | 626 | 549 | 432 |
| Lorry or Bus Occupant | 130 | 80 | | 13 | 8 | 10 |
| Others | 110 | 120 | | 45 | 10 | 4 |
| **Total** | **19,430** | **18,660** | **18,420** | **1,251** | **1,088** | **881** |

*Source www.swov.nl*

An assessment of accident data relating to cyclists indicates that the fatality risk to those aged 75 years or more is 12 times higher than the average. Cyclists aged between 12 and 17 years are also over-represented in the number of fatalities. 55% of accidents occur with passenger cars. Primarily these accidents occur at intersections and in urban areas.

The Sustainable Safety strategy supports mixing of cycles and vehicles in low speed environments (30km/hr or less), separation of transport modes in higher speed environments, and targeted speed reductions where pedestrians and cyclists cross the flow of motorised traffic. In addition, the strategy recommends education for cyclists and pedestrians about their responsibilities, highlighting the need for them to be aware that their actions need to be predictable by other road users, riding with proper lights on their bicycle, and obeying of traffic signals (no running of red lights).

Mopeds

Motorcycle and moped riders are overly represented in accident statistics. The current statistics are;

| | Fatalities per billion thousand kilometres |
|---|---|
| Car occupant | 3 |
| Cyclist | 12 |
| Motorcyclist | 75 |
| Moped rider | 91 |

*Source SWOV*

Mopeds use bicycle paths where the adjacent road has a speed limit of 50 km/h or greater. Signage is installed to indicate shared use of the bicycle path where this applies. When using the bicycle path, mopeds must limit their speed to 40 km/h.

Licensing of mopeds is currently being introduced in the Netherlands. This will allow improved enforcement by camera surveillance for issues such as red-light running, speed violations and not wearing a crash helmet.

It is acknowledged by SWOV (Netherlands Institute for Road Safety Research) that apart from education and a focus on motorcycle friendly infrastructure improvements, there are currently insufficient positive strategies and actions in place to respond to motorcycle and moped accidents.

Road pavement markings

To improve separation of opposing traffic directions on rural roads, centre of the road pavement markings are separated. This separation gives greater prominence to the centre of the road markings. The markings however are reliant on responsible driver behaviour when overtaking.

Variable speed limit signage

There is an objective that traffic on motorways will have an average speed of 60 km/h for their journey. To assist in managing traffic volumes during peak times and in response to varying conditions (wet weather, fog etc), variable speed limits have been implemented for major roads.


Traffic signals within roundabouts

To improve safety and traffic flow through roundabouts, traffic signals may be incorporated into the approach or within the actual roundabout. This is generally necessary where traffic flows into a roundabout are dominated by one of the roundabout approaches or where traffic accidents require metering of flows.

Urban speed limit

Speed is a crucial factor in road safety. It is estimated that excessive speeds are a factor in 25 to 30% of fatal road crashes (SWOV, 2006).

The desired framework for establishing speed limits throughout the Netherlands is risk based, with the principal that the most vulnerable road users involved should not sustain fatal injuries as a result of an accident. This is influenced by the Swedish Vision Zero road strategy.

| | |
|---|---|
| Locations with possible conflicts between cars and pedestrians | 30 km/h |
| Intersections with possible side collisions between cars | 50 km/h |
| Roads with possible frontal collisions between cars | 70 km/h |
| Roads with no possibility of side or frontal collisions | 100 km/h |

*Source SWOV*

To reinforce the urban speed limit of 30 km/h, threshold traffic calming works are utilised.


Reference for further information www.swov.nl/UK

## 3.7.2 SWOV - Institute for Road Safety Research

### General

SWOV was established in 1962 and is the Netherlands Institute for Road Safety Research. The Institute's charter is to promote and improve road safety using knowledge from scientific research. The results of research activities are disseminated to policy makers and professionals involved in road safety and traffic issues, both within the Netherlands and abroad.

### Presentations

The study group was provided with presentations that outlined the following:

- Overview of the SWOV and its research;
  - Organisation profile (staff of 47.5),
  - Research program, covering aspects such as road safety, infrastructure and crash risks, speed behaviour, speed management, road networks and layout, novice drivers and training, education and information campaigns, optimal investment in safety improvements, and road safety decision-making,
  - Accident history of the Netherlands, where fatalities have declined from in excess of 3000 in the early 1970s to 881 in 2004,
  - Netherlands have achieved the largest road safety improvements compared to the rest of the European Union, and
  - Outline of current thinking and strategies in road safety.
- Advancing Sustainable Safety - Road Safety Strategy 2005 – 2020;
  - Traffic road safety policy development,
  - Proactive approach to addressing road safety and driver behaviour,
    - § assessing significance of injury accidents
    - § designing systems to allow drivers to use them safely
  - Sustainable Safety principles include,
    - § functionality of roads
    - § homogeneity of masses and/or speed and direction
    - § predictability of road course and road user behaviour by a recognizable road design
    - § state of awareness of the road user
    - § forgivingness of the environment and of road users
  - Prevention of conflicts between road users, where this is not possible assessing infrastructure improvements or lowering of speed limits,
  - Establishment of a hierarchy of speed limits based upon potential conflict,
  - Educational initiatives, and
  - Influence on industry.

## Road Safety Initiatives and Observations

Advancing Sustainable Safety

The concept of Sustainable Safety was launched in 1992 with the vision;

> *"In a sustainably safe road traffic system, infrastructure design inherently and drastically reduces crash risk. Should a crash occur, the process that determines crash severity is conditioned in such a way that severe injury is almost excluded."*

This original strategy has recently been updated as "Advancing Sustainable Safety - National Road Safety Outlook for 2005 - 2020".

The objective of Sustainable Safety is to prevent (serious) crashes, and where this is not possible, to reduce the chance of severe injury.

The principles of Advancing Sustainable Safety are;

| **Sustainable Safety principle** | **Description** |
|---|---|
| **Functionality** of roads | Monofunctionality of roads as either through roads, distributor roads, or access roads, in a hierarchically structured road network |
| **Homogeneity** of mass and/or speed and direction | Equality in speed, direction, and mass at medium and high speeds |
| **Predictability** of road course and road user behaviour by a recognizable road design | Road environment and road user behaviour that support road user expectations through consistency and continuity in road design |
| **Forgivingness** of the environment and of road users | Injury limitation through a forgiving road environment and anticipation of road user behaviour |
| **State of awareness** by the road user | Ability to assess one's task capability to handle the driving task |

*Source SWOV*

Advancing Sustainable Safety makes road safety recommendations relating to Infrastructure, Vehicles, Intelligent Transport Systems, Education, Regulations and Enforcement, Speed Management, Drink and Drug Driving, Young and Novice Drivers, Cyclists and Pedestrians, Motorised Two-Wheelers, and Heavy Goods Vehicles.

Reference for further information www.swov.nl/UK

## 3.7.3 Ministry of Transport, Public Works & Water Management

### General

The Ministry of Transport, Public Works & Water Management has the responsibility for formulating road safety policy and associated action programs and objectives.

### Presentations

The study group was provided with a presentation that outlined the following:

- Overview of the Netherlands;
  - population 16.3 million,
  - 6.9 million cars,
  - 13 million bicycles,
  - 0.5 million mopeds, and
  - 5.4 fatalities per 100,000 population (Victoria in 2004 - 6.85 deaths per 100,000 population, 8.28 for the rest of Australia (VicRoads)).
- National Mobility policy document;
  - Allocation of funding to regional areas,
  - Measures aimed at new and novice drivers,
  - Penalty framework,
  - Alcohol initiatives,
  - Safety measures in freight transport, and
  - Education campaigns in combination with enforcement.
- Decentralisation of road safety responsibilities to regions;
  - Allocation of funding for road safety initiatives, and
  - Implementation of initiatives to address local issues.
- Establishment of road safety targets for future years;
  - Targets for reduction of fatalities - 15% by 2010 and 45% by 2020.
- Influence on industry to develop safer vehicles.

### Road Safety Initiatives and Observations

<u>Mobility policy document</u>

The Ministry of Transport, Public Works and Water Management has developed a National Mobility Policy Document which has a focus for the period through to 2020. The objective of the document is to increase reliability of transport by road, rail and water.

A vision of the document is that in the year 2020, traffic jams will be 40% shorter, despite a 20% increase in passenger transport and an increase of 40 to 80% in goods transport.

Targets are established within the document focusing on the reduction of fatal and serious injury accidents;

2010

- a maximum of 750 fatalities (reduction of 15%)
- a maximum of 17,000 serious injuries (reduction of 7.5%)

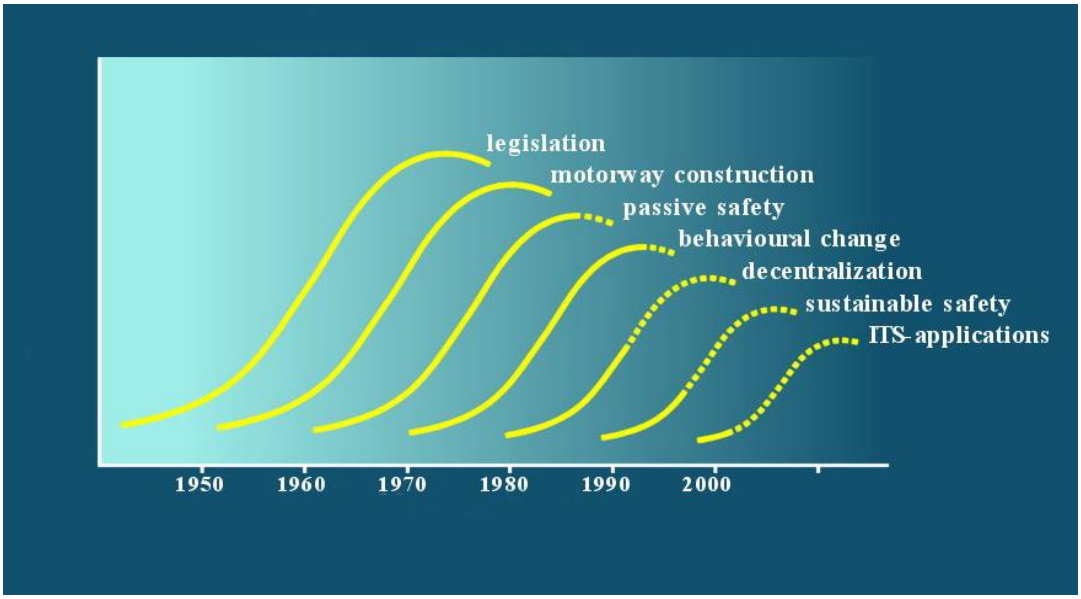
2020

- a maximum of 580 fatalities (reduction of 45%)
- a maximum of 12,250 serious injuries (reduction of 34%)

There is also a proposal for categorisation of serious injuries, to better understand recovery needs, social cost, and the severity of injuries. This will then allow enhancement of safety measures, with a focus on minimising the severity of injuries that occur.

To assist in achieving these targets, the document recommends:

- Development of regional road safety plans. These will be assisted by funding from government (€800 million) for sustainable safe infrastructure and education initiatives;
- Implementation of intelligent vehicle measures, including intelligence speed adaptation, in-car advisory systems and other initiatives;
- Continuing education, communication and enforcement;
- Introduction of road pricing, where users of the road system during peak hours incur a higher cost than during off-peak hours. The pricing structure would recognise fuel-efficient (green) vehicles, in the road pricing structure. This initiative is expected to reduce congestion during peak periods, therefore improving road safety and efficiencies for transport; and
- Decentralisation to regional and local authorities, the responsibilities to implement efficient and integrated solutions to road safety problems.




*Source Ministry of Transport, Public Works and Water Management*

Reference for further information www.verkeerenwaterstaat.nl/english/

## 3.7.4 Regional Organisation of ROV - Zuid Holland

### General

ROV – ZH is the regional road safety organisation for the province of Zuid (South) Holland.

### Presentations

The study group was provided with a presentation that outlined the following:

- Overview of the ROV – ZH organisation;
- Local road safety campaigns and initiatives;
  - Infrastructure initiatives,
  - Road safety planning,
  - Communication with other regional road safety organisations,
  - Education at a local level involving primary and secondary school children,
  - Annual road safety communication campaign,
  - Young driver initiatives,
  - Enforcement and legislation changes, and
  - Involvement in road safety audits.
- Tour of the local area;
  - Demonstration by local police of in-car speed camera and handheld radar gun systems.

### Road Safety Initiatives and Observations

<u>Enforcement</u>

Whilst it is desirable that the road environment influences the behaviour of drivers to travel at appropriate speeds, and that this is reinforced through appropriate signage and education campaigns, it is recognised that enforcement is required to address violation of road rules.

Similar to Australia, education and enforcement campaigns in the Netherlands have achieved successes in responding to driving speed, drink-driving and seat belt use.

Throughout the Netherlands police use handheld radar for speed detection, in car speed cameras, fixed speed cameras and point to point speed detection.

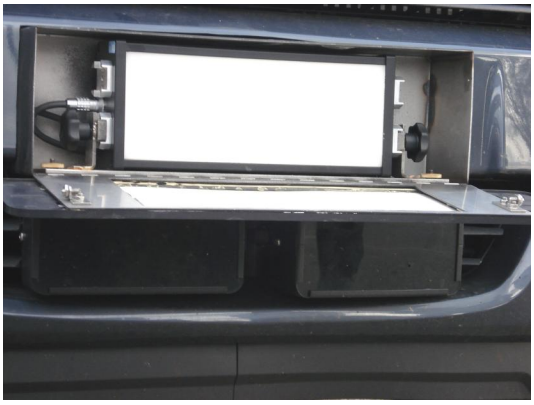




*Image SWOV*

Education

The regional road safety organisations place a high emphasis on communication and education to reinforce road safety. The national annual road safety campaign includes initiatives such as:

- identifying a dedicated driver who will not drink and therefore ensure friends travel safely;
- raising motorist awareness of school children returning to school after holiday periods and their use of bicycles;
- seatbelt wearing;
- child safety restraints in vehicles;
- avoid aggressive driving behaviour - keep your distance;
- cyclists using reflectors and lights;
- importance of motorcyclists wearing helmets; and
- heavy vehicle safety.

Road safety education also occurs within schools. Interactive programs have been established with primary school age children to raise their awareness of road safety issues and using roads safely, particularly cycling. An initiative introduced is the engagement with primary school children to identify local road safety hazards which they experience when travelling to and from school. The children then present these to the local authority for action. Secondary school students are provided with moped training and special driver training.

*Image ROV-ZH*

*Image ROV-ZH*


*Image ROV-ZH*

Reference for further information www.rovzuidholland.nl

## 3.7.5 Municipality of Almere

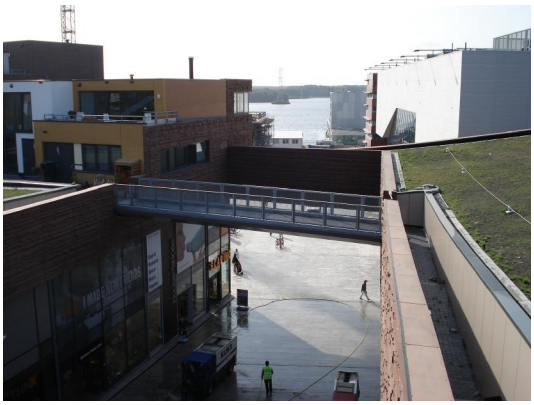
### General

Almere (old Dutch for "great lake") is a new municipality in the central Netherlands formed on reclaimed land that was once the South Sea. Almere is the fastest growing new town in Europe, growing at a rapid rate to support population growth that can no longer be accommodated by the city of Amsterdam. Almere has a current population of 180,000 and projected population of 400,000.

### Presentations

The study group was provided with a presentation that outlined the following:

- The development of Almere;
  - Amsterdam is at capacity, hence the need for Almere which is a totally planned city,
  - Dykes constructed in 1926,
  - Land reclaimed since then for development of the city,
  - City is 4.5 to 5 metres below sea level, and
  - Population in 1979 was 5,000, current population 180,000.
- Business precinct currently under construction;
  - Town planning, urban design and architecture overview,
  - €3 billion development of the city centre,
  - Housing is high density, on water edge, and above shopping precinct,
  - Beneath shopping precinct is car parking, car access roads, separated dedicated bus access roads, bicycle roads,
  - 6000 car parking spaces have been provided to the city centre,
  - Automated waste disposal from street litter bins - collected via underground vacuum system,
  - Entertainment Centre adjacent to business precinct, and
  - Drinking water is taken from a ground aquifer.



- Traffic planning for the city centre and urban areas;
  - Cars are allocated third priority in planning for traffic movement, after buses and cyclists,
  - Main roads are fully separated from local access roads,
  - Dedicated bicycle roads are totally separated from other traffic,
  - Dedicated bus roads are totally separated from other traffic,
  - Interchanges of bus and bicycle roads are fully separated from vehicle traffic,
  - Council fund bus lanes and contract out bus services,
  - A bus service is considered viable for 100 homes, and
  - Future allowance for light rail/train system has been planned.

- Engineering challenges;
  - The sea bed is clay based and therefore settlement of structures is a naturally occurring problem,
  - Foundations for buildings and houses must be piled, from 8 to 20 metres in depth for all structures,
  - The sewer system is also constructed on piles,
  - Need to raise non-piled underground services after 7 years and again after 15 years. As buildings are on piles, settlement does not occur. Approximately 10% of services require replacement, 10% require relaying,
  - Footpath and road levels require adjustment on a similar frequency,
  - Connections from homes to sewers and drains are flexible to allow for settlement of services,
  - Sewers are inspected every two years with CCTV. Stormwater drains are inspected every 5 to 10 years,
  - Forward funds for undertaking works are generated by sale of reclaimed land, and
  - At present only one vehicle bridge access from Amsterdam to Almere. Currently lobbying for additional rail line, freeway and additional bridge to connect to Amsterdam.
- Tour of the municipality;
  - Visit to the Almere city centre and viewing of new developments,
  - Visit to reclaimed areas being prepared for residential development,
  - Visit to sites along an existing elevated railway where new railway stations and road under passes were under construction, and
  - Visit to Almere Poort.

## Road Safety Initiatives and Observations

Benefits of a planned city

As Almere is a fully planned city, transportation and road safety have been extremely well provided for.

Throughout the city, transport modes are separated. Dedicated pedestrian paths, bicycle paths and bus roads have been established, separated from normal vehicle traffic.

Within the city centre, vehicle traffic travels beneath the central business precinct.

In outer areas, dedicated bus roads circulate through residential areas. Pedestrian and cyclist crossings of the bus roads are signalised, with sensors installed that activate these signals such that the bus service always has priority. Interchanges of bus roads and bicycle paths are fully separated from normal vehicle traffic.

Safety for vulnerable users, such as cyclists and pedestrians, is therefore very high. Mobility for public transport and normal vehicle traffic is also extremely efficient, as a result of this high degree of separation and planning.


Reference for further information www.almere.nl

## 3.8 Independent Travelling Through the United Kingdom

Following the conclusion of the official study tour, I continued to travel through the United Kingdom visiting Ireland, Scotland and England.

This travelling provided me with further experience and a broader perspective of international road environments, treatments, and safety innovations to add to the experience of the study tour.

### Road Safety Initiatives and Observations

Signage

Signage throughout the UK was generally very informative for the driver.

Similar to Australia, there are restrictions for vehicles that utilise the freeway system. Notable restrictions listed in the UK include learner drivers, vehicles under 50 cc and slow vehicles travelling under 50 km/h.


The use of repeat advance warning signs with remaining distances (e.g. at 400 m, 200 m and 100 m) allows drivers to position themselves appropriately as they approach the change in conditions that the signs are providing warning for. In Scotland, the technique of diagonal bars that reduced in number as the driver approaches the change in conditions is used rather than a distance measurement.




Signage and road markings are regularly utilised for tourist traffic from Europe, to remind drivers that they should be travelling on the left-hand side of the carriageway.


In areas where head-on collisions have occurred, signage is used to reinforce line marking, prohibiting overtaking.

A noticeable difference in warning signage compared to Australia was the absence of recommended speeds for hazards, such as sharp bends. On occasions text warning signs advised of hazardous bends and on some occasions the word "slow" was painted on the road surface. Generally however curve warning signage, guide posts and curve alignment markers were the only warnings provided.

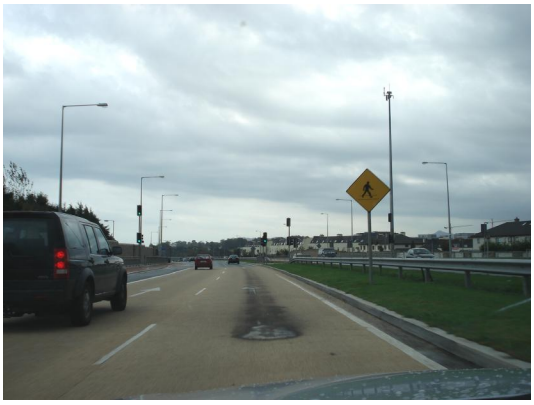



Trucks

Throughout the UK, trucks are speed limited to a maximum speed of 60 mph. It is also a requirement that slow vehicles use the left lane of motorways, unless overtaking. This is well respected on motorways throughout the UK, with traffic flow noticeably more efficient as a result.

Road pavement markings

Road pavement markings are used widely throughout the UK. Coloured pavements are also utilised for bus lanes, cycle lanes, side road intersection thresholds and at approaches to pedestrian crossings and traffic intersections.

The use of road pavement text messages as advance directional information allows drivers to be certain of the correct lane to be travelling within as they approach roundabouts and other intersections. This avoids “last second” lane changes by drivers at intersections, improving road safety and traffic flow.


Warning messages are also provided to drivers in conjunction with road signage.



Cross hatching is utilised as a "keep clear" zone across intersections regularly.

Motorway safety

An initiative to improve safety on motorways is the installation of chevron pavement markers along sections of the motorway with accompanying signage advising motorists to keep two chevron bars between vehicles. The chevron markers are set for maximum travelling speed of 70 mph.


Public Transport

Bus stops throughout the UK are generally within the travelling lane, as compared to Australia where bus stops are often intended. This is due to limited width within the road reserve, and has the benefit of allowing buses to continue without the delay of having to merge with through traffic. Traffic is required to stop behind a bus that pauses at a bus stop, unless centreline markings allow overtaking.


Variable speed limits & changeable message signs

Variable speed limits are utilised on motorways to assist with traffic flows and road safety. A reduction in the speed limit is implemented during peak periods, in the event of an incident, and during wet weather. Changeable message signs are used in conjunction with variable speed limit signage to provide motorists with information associated with their use of the motorway.




Typical messages provided by changeable message signs include warnings about an incident ahead, slowdown for wet conditions and construction works ahead. A system of junction numbers is utilised along the motorway to provide motorists with specific locations associated with the warning messages.

Bicycle paths

Whilst not at the standard observed in the Netherlands, cycle lanes were often provided in the city areas with coloured pavements.


Township threshold treatments

Throughout Ireland, Township threshold treatments were often in place to highlight to the motorist the need to reduce speed as they entered into a Township area. This was observed to be an effective treatment for reducing the speed of motorists.


Signalised roundabouts

To improve traffic flow and manage dominant roads leading into roundabouts, traffic signals were often observed throughout the UK as part of roundabout treatments. In outer areas part time traffic signals were utilised to manage traffic flow during peak periods.


Solar powered raised reflective pavement markers

Throughout Ireland, solar powered raised reflective pavement markers were used extensively in areas where street lighting was not available. These pavement markers light up in low light, such as during the evening and in wet conditions, and assist drivers by illuminating the centreline of the roadway.

Pedestrian crossing at traffic signals

Within major cities, traffic signals were generally configured such that pedestrians crossed at one time in all directions. The benefits of this treatment was that all vehicular traffic was stopped, providing a safe environment for pedestrians to cross the road, there was no conflict between pedestrians crossing a road and left turning vehicles, and there is no delay for left turning traffic due to pedestrians crossing the road.


# 4 Road Safety – An International Perspective

## 4.1 Study Tour Objective

The focus of this study tour was to draw comparison with the United States, United Kingdom and the Netherlands arrangements in the areas of:

- levels of accountability and authority provided to Local Government in relation to road safety and speed limits;
- relationship between government levels with regard to road safety, from a Local Government perspective;
- speed limit frameworks and their relationship to road environment and condition;
- local initiatives undertaken to achieve improved road safety and their effectiveness; and
- opportunities for further enhancement of road safety from a Local Government perspective.

### Accountability and authority

Similar to Australia, delegation of accountability and authority to Local Government occurs in the context of a broader framework determined at a State (United States) or Federal (United Kingdom and Netherlands) level. It is considered that this is a sound approach to ensure that a consistent framework for road management and safety is in place.

Local authorities are at risk of becoming parochial and driven by local community and political pressures to implement changes that may or may not be consistent with a road safety focus.

Higher levels of government are best placed to strategically consider, fund and initiate short, mid and long term initiatives focused on road management and road safety.

State Government in Australia, whilst having broader responsibilities than Local Government, generates significantly greater funding per capita. The ability to implement broad initiatives and fund large-scale projects is therefore easier to undertake than at the local level. State Government also has greater ability to support and influence industry to develop and implement technological initiatives that can achieve widespread and significant safety gains. From an education perspective, State Government has the ability to coordinate educational and promotional programmes on a widespread basis, through a range of mediums and targeted at various age groups. Integrated with this, State Government has the responsibility for policing, and therefore the ability to influence enforcement methods to support the road safety and management framework.

It is however considered that engagement of Local Government is critical to ensure that local views and experiences contribute to strategies and initiatives in their development and implementation.

It is considered that the extent of delegation provided to Local Government in the exercise of powers related to road management and road safety can be increased, however for this to be successfully achieved requires informative guidelines for the exercise of such powers to ensure that a statewide consistency is maintained. Validation of powers exercised could occur through a regular reporting and audit process.

### Relationships

The relationship between government levels is often tainted with a degree of frustration. From a Local Government perspective, there is the endeavour to gain approval or to seek funding for initiatives that are being pursed. From a state government perspective, there is an endeavour to achieve consistency and cooperation from numerous Local Government bodies to meet higher order strategic direction and objectives.

Cooperation, engagement, interaction, understanding and trust are aspects and values that relationships need to be based upon to achieve positive and ongoing successful outcomes.

It is considered that the strategic direction and focus on educational initiatives related to road safety demonstrated at a Federal level in the Netherlands, and their focus on developing partnerships with provincial and Local Government bodies, ensures that there is a consistent and common direction for pursuing road safety initiatives, and that the model and intent of this relationship should be embraced.

## Speed limit frameworks

Similar to Australia, speed limit frameworks are determined at a State (United States) or Federal (United Kingdom and Netherlands) level. This ensures consistency for the motorist and the community.

Lower residential speed limits were observed in the Netherlands (30 km/hr), determined on the basis of providing a safe environment for areas where pedestrians and children may interact with the road space. Within the United Kingdom 20 mph (33 km/hr) zones were observed, however typically the urban speed limit is 30 mph (50 km/hr). Throughout the United States, speed limits in residential streets may vary from 25 – 30 mph (40 – 50 km/hr), as determined by the relevant State Government.

Two lane rural roads had speed limits of 60 mph in the United Kingdom, 100 km/hr in the Netherlands, and range from 45 – 65 mph in the United States.

Highways and motorways, have speed limits of 70 mph (110 km/hr) in the United Kingdom, 120 km/hr in the Netherlands and 65 – 75 mph (105 - 120 km/hr) in the United States.

Throughout the Netherlands, it was highlighted that accidents on two lane rural roads are over represented against other road categories. It is considered that there is an inconsistency in that high speeds are permitted on these roads, that generally have a far less forgiving roadside environment and lower standard of separation between opposing traffic directions, compared to highways and motorways. This issue has been experienced in Victoria, with a number of municipalities calling for a review of unsealed rural road speed limits.

## Road safety initiatives and opportunities

Road safety initiatives and opportunities that could be translated to the Victorian and Australian system that were observed and are considered to have been effective include:

- minimum speed limits for motorways and highways;
- road pavement chevron markers to indicate to drivers a safe following distance when travelling at high speed;
- intelligent transport systems;
    - variable speed limits for motorways and highways,
    - changeable message signs for providing information to the driver, and
    - in-car driver information systems.
- road pavement text markings;
- repeat advanced warning signs with distance information;
- count down timer for pedestrian crossings;
- road safety training programs;
- in lane rumble bars;
- high visibility speed cameras;
- use of speed cameras in road construction zones;
- separated bicycle facilities;
- strategic road safety planning;
- education programs focused on road safety;
- slow vehicles using left lane compliance;
- township speed zone threshold treatments;
- solar raised reflected pavement markers; and
- pedestrians crossing traffic signals in all directions at the same time.

Each of these initiatives are described throughout the report. It is considered that these initiatives could be integrated into the road system throughout Victoria, and Australia, and that there will be opportunities for varying degrees of road safety improvement. It must also be acknowledged that state authorities in Australia may have trialled and/or evaluated many of these initiatives.

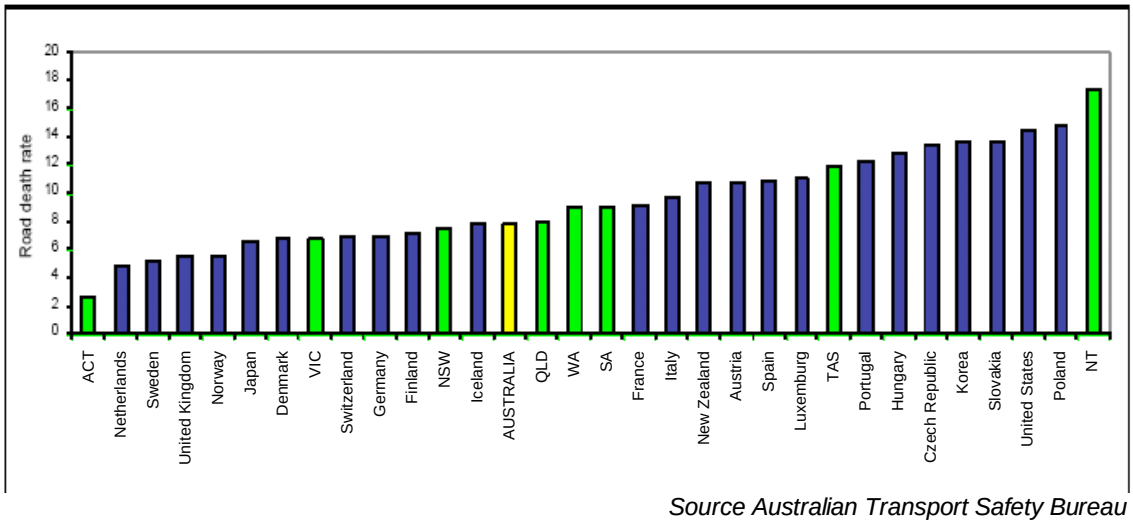
## 4.2 How Does Victoria and Australia Compare

In comparison to the United Kingdom, United States and Netherlands, Australia compares favourably from a road safety perspective.

Comparative fatalities and serious injuries per 100,000 population (2004 data) are as follows:

| | Fatalities | Serious Injuries |
|---|---|---|
| Victoria | 6.85 | 134 |
| Australia | 7.9 | 113 (2002 data) |
| United Kingdom | 5.6 | 356 |
| Netherlands | 5.4 | 113 |
| United States | 14.5 | 647 |

*Sources: OECD International Traffic Safety Data and Analysis Group*
*US National Highway Traffic Safety Administration*
*Australian Transport Safety Bureau*
*UK Department for Transport*
*SWOV (Netherlands)*
*VicRoads*




*Source Australian Transport Safety Bureau*

Whilst local knowledge and familiarisation with Victorian conditions may have an influence, it is considered that on balance road safety arrangements in Victoria are at a comparatively high standard. Comparative data collected for OECD countries (above) demonstrates Victoria to be in the company of world leaders in road safety standards. Further data is provided in Appendix 3 - Road deaths per 100,000 population, OECD nations, OECD median, and Australian States/Territories, 1975 to 2004.

Initiatives that exist within Australia that could be of advantage internationally include:

- vibrotactile pedestrian signals;
- school speed zones;
- advisory speed limits for curves and other road hazards; and
- educational programmes focused on drink and drug driving, etc.

### 4.2.1 How can Local Government become more effective in road safety

Whilst the desirable framework for road management and road safety is considered to be one that is led from a state perspective, it is considered that Local Government is best placed to recognise and advocate on local issues. The direct contact that Local Government has with the community allows quality interaction and feedback to be gained in understanding and considering issues, and in the development of proposals.

The role Local Government can play in contributing to road safety initiatives includes:

- A focus on addressing issues at the local community level, having regard to local amenity and aesthetics, and developed through a quality community consultative process;
- Ensuring that local issues are understood at a State Government level, i.e. the community is being heard;
- Advocating for change where statewide systems do not fully respond to local issues;
- Development of local strategies and initiatives to respond to local road safety issues;
- Interacting and networking with municipalities at a regional level to develop regional road safety initiatives and to expand the knowledge of staff involved in road safety related activities;
- Providing feedback to the State Government agency on local issues and the success or complications with the introduction/implementation of state-controlled measures;
- Active participation in State and industry reference groups and forums, to contribute the Local Government perspective to discussions and initiatives; and
- Lobbying for State and Federal funding for addressing local issues.

## 4.3 Recommendations

I make the following recommendations on the basis of my research and observations of initiatives demonstrated by overseas colleagues, that I consider can be applied here in Victoria:

For consideration by State government bodies;

1. Trial of the count down timer arrangement for pedestrian crossings in locations where problems exist with pedestrians delaying traffic movements due to a disregard of the flashing red phase of the pedestrian signalisation or where there is a history of pedestrian accidents.

2. Trial of rephasing traffic signals such that pedestrians cross in all directions at one time (as exists at the intersection of Elizabeth Street and Flinders Street, Melbourne), for locations where pedestrian and vehicle numbers are high and where pedestrian safety and traffic flow may be improved.

3. Establishment of an interactive driver information system to assist motorists with real-time information regarding traffic flow in the metropolitan area.

4. Installation of changeable message signs for the freeway network.

5. Extend the use of variable speed limit signage for the freeway network to improve road safety and traffic flow.

6. Trial of road surface pavement markings to raise driver awareness of hazards and other road user information.

7. Trial the use of pavement markings to indicate to drivers the appropriate distance for following vehicles on high-speed roads, in locations of high incidents.

8. Trial increased separation of centre of the road line marking in areas where head-on collisions are of significance.

9. Trial of thermoplastic transverse rumble bars to improve safety in high incident areas.

10. Install repeat advanced warning signs with remaining distances to improve driver information as they approach the changing condition that the signs are providing warning for, and develop guidelines to determine the extent of their use.

11. Consider the use of township threshold treatments to influence lower speeds at the township entries.

12. Increase conspicuity of traffic cameras to improve the public perception relating to cameras and to improve road safety at the high incident locations where cameras have been installed.

13. Implement the utilisation of speed cameras in road construction zones, to ensure motorists travel at appropriate speeds and to improve worksite safety.

14. Develop initiatives to gain improved compliance by heavy vehicles to use the left lane unless overtaking, on freeways and multilane highways.

15. Provide increased support and funding for higher standard bicycle facilities and treatments, to improve safety for cyclists and to encourage an increase in cycling.

16. Develop improved partnerships with Local Government to develop and respond to initiatives within the State's road safety strategy.

17. Provide increased support to Regional Road Safety Groups and Local Government for development of local road safety and education initiatives.

For consideration by Local Government;

18. Continue to implement initiatives and respond to community needs in relation to road safety.

19. Development of road safety strategies that respond to local and regional issues, and that have regard to the State Government's road safety strategy.

20. Continue to focus on addressing issues at the local level, and broadening the understanding and knowledge of community views towards improvement of road safety.

21. Advocacy to the State for support and improved funding programs to respond to and address local road safety issues.

22. Advocacy to the State for change and improvement, where statewide initiatives do not fully and appropriately address local issues.

23. Actively provide feedback to the State Government on local issues associated with road safety.

24. Participate in trials of road safety treatments and initiatives, and provide input and feedback to the State Government.

25. Participate in regional groups to develop road safety initiatives and to broaden the knowledge of public works practitioners in road safety.

For consideration of IPWEA;

26. Continue to represent public works in industry forums and working groups relating to road safety initiatives.

27. Establish statewide and regional road safety forums where public works practitioners can exchange views and issues.

28. Facilitate training programs relating to road safety needs in public works.

29. Collation of references, guidelines and educational information related to road safety and public works engineering into a central location from which public works practitioners can refer or purchase when required.

30. Collation of training and education sources related to road safety and public works engineering into a central location from which public works practitioners can refer when required.

## 4.4 Conclusion

The experience of participating in the 2006 International Study Tour was extremely valuable and educational.

The road safety initiatives and observations made during the course of the study tour has provided me with a broader perspective and increased knowledge for responding to road safety challenges, which will be utilised in my day to day position as well as in advocacy and representative roles that I currently participate in on behalf of the IPWEA and Local Government.

There are a number of recommendations that have been listed as a result of participating in the study tour, and it must be acknowledged that a number of these may have already been assessed at a state level. However, it is considered that in their overseas environment each of these initiatives were adding to the road safety environment.

In comparison to the destinations that were visited, whilst possibly biased and influenced by local knowledge, I do consider that on balance road safety arrangements in Victoria are at a high standard, with road safety data confirming that Victoria is in the company of world leaders from a road safety perspective.

# 5 Appendices

## APPENDIX 1 - Study Tour Participants

| State | Participant | Position | Organisation |
|---|---|---|---|
| National | Chris Champion | Chief Executive Officer | IPWEA National (Tour Leader) |
| National | David Abbott | National President | IPWEA National |
| NSW | Geoff Metcalfe | Engineering Development Co-ordinator | Port Macquarie Hastings Council |
| Qld | Graham Bilton | Manager Traffic Management & Operations | Gold Coast City Council |
| Qld | Daryl Collins | Manager Business Systems | Gold Coast City Council |
| Qld | Rod Kennedy | Infrastructure Manager | Logan City Council |
| SA | Angelo Catinari | Manager Infrastructure Services | City of West Torrens |
| Vic | Doug Bradbrook | Team Leader Traffic & Road Safety | Mornington Peninsula Shire |
| Vic | Mark Varmalis | Manager Civil Development Services | Yarra Ranges Shire |
| WA | Dave Harris | Director Infrastructure | City of Gosnells |

## APPENDIX 2 - Itinerary

| IPWEA NATIONAL STUDY TOUR 2006: HOSTED VISITS & ACTIVITIES | | | |
|---|---|---|---|
| **Date & Time** | **Partnering / Host Organisation** | **Topics & Activities** | **Coordination Officers** |
| **SAN FRANCISCO** | | | |
| **Sun 3 Sept**<br>pm | | After checking into hotel walk up through Chinatown and other areas of the city | |
| **Mon 4 Sept**<br>8.00am | (Public Holiday) | City Tour by Coach - hotel pick up City Tour Start | |
| 2.45pm | | Alcatraz Visit | |
| 5.00pm | | Fishermans Wharf for tour of sights<br>Cable car back to hotel. | |
| **Tues 5 Sept**<br>9.00am | Travel by BART Chicago to San Leandro Station<br>City of San Leandro 835 E 14 Street | | |
| 10.00am – 3.00pm | City of San Leandro, California<br>www.ci.san-leandro.ca.us | Meetings with City Planning and Redevelopment staff<br><br>Hosted Lunch<br><br>Bus Tour of City & key facilities | Uche Udemezue<br>Director Engineering & Transportation<br>Hanson Hom<br>Director of Community Development<br>Luke Sims<br>Business Development Manager<br>Reh-Lin Chen<br>Senior Transportation Engineering<br>Michael Bakaldin<br>Public Works Director |
| 7.00pm | | McAfee Coliseum<br>Travel by BART | Oakland Athletics vs, Texas Rangers<br>Metropolitan League Baseball (MLB) |

| IPWEA NATIONAL STUDY TOUR 2006: HOSTED VISITS & ACTIVITIES | | | |
|---|---|---|---|
| **Date & Time** | **Partnering / Host Organisation** | **Topics & Activities** | **Coordination Officers** |
| **Wed 6 Sept**<br>9.00am –<br>12.00pm | Metropolitan Transport Commission (MTC)<br>MetroCenter, 101 Eight Street (3rd Floor)<br>Oakland, CA 94607<br>www.mtc.ca.gov | Presentations on<br>• TLC - Transportation for Liveable Communities,<br>• smart growth,<br>• pavement management system,<br>• intelligent transport systems<br>• vehicle infrastructure integration | Brenda Kahn<br>Senior Public Information Officer<br>Doug Johnson<br>Transportation Planner/Analyst<br>Sui Tan<br>StreetSaver Program Coordinator<br>Theresa Romell<br>Scott Rodda<br>Translink Program Director<br>Ben McKeever |
| 12.15pm | | Travel by BART to Lake Merritt Station | |
| 12.30pm –<br>2.45pm | California Transport Authority (CALTRANS)<br>www.dot.ca.gov | Smart Growth projects<br>Presentation and tour 511 Command Centre | Shauna Callow<br>Albert Yee |
| 3.00pm –<br>5.00pm | Panoramic Interests, Berkeley<br>www.panoramicinterests.com | Presentation and visit to local private urban redevelopment projects | Patrick Kennedy<br>Managing Director<br>Ted Droettboom |
| **CHICAGO** | | | |
| **Thurs 7 Sept**<br>7.00pm | Chicago Chapter representatives | Famous Chicago Pizza for dinner at Giordanos<br>Discussion with on issues of interest | Larry Lux<br>Former Board Member APWA<br>Member APWA IAC Committee |
| **Fri 8 Sept**<br>9.00am –<br>12noon | Chicago Metropolitan Agency for Planning<br>Suite 800, Sears Tower<br>www.chicagoareaplanning.org | Planning & Transportation presentations by key staff members of CMAP<br>Landuse & Transport Planning for the Future<br>Transportation Project Planning | Gordon Smith<br>Dep Exec Dir, External Affairs<br>Jill Leary<br>Chief of Staff<br>Ty Warner<br>Director of Planning Services<br>Tom Murtha<br>Chief Transportation Planner |

| IPWEA NATIONAL STUDY TOUR 2006: HOSTED VISITS & ACTIVITIES | | | |
|---|---|---|---|
| **Date & Time** | **Partnering / Host Organisation** | **Topics & Activities** | **Coordination Officers** |
| 1.00pm | | Architecture Foundation River Cruise<br>Millenium Park<br>Chicago's famous "Magnificent Mile" | |
| **KANSAS CITY** | | | |
| **Sat 9 Sept**<br>6pm | Chicago Chapter | pre-conference Chapter Dinner | Larry Lux |
| **Sun 10 Sept** | APWA International Public Works Congress and Exposition | Refer to Congress program for full details<br>First Timers Breakfast<br>Opening Session<br>Get Acquainted Forum | |
| **Mon 11 Sept** | APWA International Public Works Congress and Exposition | Refer to Congress program for full details<br>CPWA Luncheon<br>International Reception | |
| **Tues 12 Sept** | APWA International Public Works Congress and Exposition | Refer to Congress program for full details<br>Nevada Chapter Dinner | |
| **Wed 13 Sept** | APWA International Public Works Congress and Exposition | Refer to Congress program for full details<br>IPWEA Presentation: An International Crisis – Attracting & Recruiting Public Works Staff<br>Technical Tour<br>Congress Banquet | |

| IPWEA NATIONAL STUDY TOUR 2006: HOSTED VISITS & ACTIVITIES | | | |
|---|---|---|---|
| **Date & Time** | **Partnering / Host Organisation** | **Topics & Activities** | **Coordination Officers** |
| **Thurs 14 Sept**<br>8.30am -<br>11.30am | Kansas City Downtown Redevelopment Project<br>www.thinkkc.com | Downtown Kansas City project overview<br><br>Presentation by Cordish Development<br><br>Presentation by Anschultz Entertainment | Doug Wesselschmidt<br>City of Shawnee, KS, USA<br>Alan Hix<br>Cordish Development<br>Mark Faber<br>Senior Vice President<br>Business Operations<br>AEG (Anschutz Entertainment Group)<br>Sean O'Bryne<br>Vice President Downtown Council |
| **LONDON** | | | |
| **Fri 15 Sept – 17 Sept** | | Sightseeing around London | |
| **NETHERLANDS** | | | |
| **Mon 18 Sept**<br>9.00am –<br>5.00pm | Municipality of Zaanstad<br>www.zaanstad.nl/ | Tour of Zaanstad,<br>Tour of Zaanse Schans<br>Tour of Alkmaar, Bergen aan Zee, Hoorn | Ilona Middelveld<br>Secretary<br>Municipality of Zaanstad |
| **Tues 19 Sept**<br>9.00am | SWOV - Institute for Road Safety Research<br>www.swov.nl/UK | Welcome by Fred Wegman, Director SWOV<br>Principles of Sustainable Safety<br>Advancing Sustainable Road Safety | Fred Wegman<br>Jacqueline Nell<br>Letty Aarts |
| 11.30am | Ministry of Transport, Public Works & Water Management<br>www.verkeerenwaterstaat.nl/english | Ministry Transport Public Works & Water Management<br>Road Safety in The Netherlands<br>Lunch at Ministry | Nel Aland<br>Coordinator International Affairs on Road Safety & Infrastructure |
| 2.00pm | Regional Organisation of ROV-ZH<br>www.rovzh.nl | Road Safety on a Regional Scale<br>Road Safety Policy in The Netherlands<br>Field Visits | J (Hans) Vergeer<br>ROV Bureau |

| IPWEA NATIONAL STUDY TOUR 2006: HOSTED VISITS & ACTIVITIES | | | |
|---|---|---|---|
| **Date & Time** | **Partnering / Host Organisation** | **Topics & Activities** | **Coordination Officers** |
| 5.00pm | | Depart for The Hague<br>Sightseeing and dinner in The Hague | Piet Paantjens<br>Former City Engineer (recently retired)<br>City of Zaanstad |
| **Wed 20 Sept**<br>9.30am | Municipality of Almere<br>www.almere.nl/live/index.jsp?loc=406&nav=411 | Spatial Planning<br>Road Safety<br>Bus Tour of city development | Edmond Moyle<br>Team Leader<br>Gemeente Almere<br>Piet Paantjens<br>Former City Engineer (recently retired)<br>City of Zaanstad |
| 2.00pm | | Depart by train for sightseeing around Amsterdam including Canals network, Nieuwmarkt | |
| **Thurs 21 Sept** | | End of Study Tour | |

## APPENDIX 3
## Road deaths per 100,000 population, OECD nations, OECD median, and Australian States/Territories, 1975 to 2004

| | 1975 | 1980 | 1985 | 1990 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Austria | 33.4 | 26.5 | 20.1 | 20.3 | 15.2 | 12.9 | 13.9 | 12.1 | 13.5 | 12.2 | 11.9 | 11.8 | 11.5 | 10.7 |
| Belgium | 24.0 | 24.3 | 18.3 | 19.9 | 14.3 | 13.4 | 13.4 | 14.7 | 13.7 | 14.4 | 14.5 | 13.1 | - | - |
| Canada | 26.7 | 22.7 | 17.3 | 14.9 | 11.4 | 10.4 | 10.2 | 9.7 | 9.7 | 9.5 | 8.9 | 9.3 | 8.7 | - |
| Czech Republic | 16.3 | 12.2 | 9.6 | 12.5 | 15.4 | 15.2 | 15.5 | 13.2 | 14.1 | 14.5 | 13.0 | 14.0 | 14.2 | 13.5 |
| Denmark | 16.4 | 13.5 | 15.1 | 12.3 | 11.1 | 9.8 | 9.3 | 9.4 | 9.7 | 9.3 | 8.1 | 8.6 | 8.0 | 6.8 |
| Finland | 19.4 | 11.5 | 11.1 | 13.0 | 8.6 | 7.9 | 8.5 | 7.8 | 8.4 | 7.7 | 8.4 | 8.0 | 7.3 | 7.2 |
| France | 27.3 | 25.1 | 20.6 | 19.8 | 15.3 | 14.7 | 14.4 | 15.2 | 14.4 | 13.6 | 13.8 | 12.9 | 10.2 | 9.2 |
| Germany | 22.0 | 19.3 | 13.0 | 14.0 | 11.6 | 10.7 | 10.4 | 9.5 | 9.5 | 9.1 | 8.5 | 8.3 | 8.0 | 7.1 |
| Greece | 13.8 | 15.0 | 20.2 | 20.2 | 23.1 | 20.6 | 20.0 | 20.7 | 20.1 | 19.3 | - | - | - | - |
| Hungary | 16.0 | 15.2 | 16.5 | 23.4 | 15.5 | 13.4 | 13.7 | 13.5 | 12.9 | 11.9 | 12.1 | 14.0 | 13.1 | 12.8 |
| Iceland | 15.1 | 11.0 | 10.0 | 9.4 | 9.0 | 3.7 | 5.5 | 9.8 | 7.5 | 11.3 | 8.4 | 10.1 | 7.9 | 7.8 |
| Ireland | 18.4 | 16.6 | 11.6 | 13.6 | 12.1 | 12.5 | 12.9 | 12.4 | 11.0 | 11.0 | 10.7 | 9.6 | 8.4 | - |
| Italy | 18.6 | 16.4 | 13.5 | 12.4 | 12.3 | 11.7 | 11.7 | 11.9 | 11.5 | 11.5 | 11.6 | 11.8 | 10.6 | 9.7 |
| Japan | 12.5 | 9.7 | 9.9 | 11.8 | 10.1 | 9.3 | 8.9 | 8.5 | 8.2 | 8.2 | 7.9 | 7.5 | 7.0 | 6.7 |
| Korea | 12.6 | 17.2 | 21.4 | 33.4 | 26.6 | 32.3 | 29.3 | 22.6 | 23.2 | 21.8 | 17.1 | 15.2 | 15.0 | 13.6 |
| Luxembourg | 34.7 | 27.0 | 21.6 | 18.8 | 17.0 | 17.2 | 14.4 | 13.4 | 13.5 | 17.5 | 15.9 | 14.0 | 11.8 | 11.1 |
| Netherlands | 17.1 | 14.2 | 9.9 | 9.2 | 8.6 | 7.6 | 7.5 | 6.8 | 6.9 | 6.8 | 6.2 | 6.1 | 6.3 | 4.9 |
| New Zealand | 20.0 | 18.9 | 22.6 | 21.4 | 15.9 | 13.8 | 14.4 | 13.2 | 13.4 | 12.1 | 11.8 | 10.3 | 11.5 | 10.7 |
| Norway | 13.5 | 8.9 | 9.7 | 7.8 | 7.0 | 5.8 | 6.9 | 8.0 | 6.8 | 7.6 | 6.1 | 6.9 | 6.2 | 5.7 |
| Poland | 16.5 | 16.8 | 12.6 | 19.2 | 17.9 | 16.5 | 18.9 | 18.3 | 17.4 | 16.3 | 14.3 | 15.2 | 14.8 | 15.0 |
| Portugal | 34.7 | 27.7 | 22.1 | 28.2 | 25.2 | 25.4 | 23.4 | 22.4 | 21.0 | 18.1 | 16.2 | 16.1 | 14.8 | 12.3 |
| Slovakia | - | - | - | - | 12.3 | 11.5 | 14.6 | 15.2 | 12.0 | 11.6 | 11.4 | 11.3 | - | - |
| Slovenia | 32.9 | 29.2 | 23.5 | 25.9 | 20.9 | 19.5 | 18.0 | 15.6 | 16.9 | 15.8 | 13.9 | 13.5 | 12.1 | 13.7 |
| Spain | 16.6 | 17.6 | 16.6 | 23.2 | 14.7 | 14.0 | 14.3 | 15.1 | 14.5 | 14.5 | 13.8 | 12.9 | 12.8 | 11.0 |
| Sweden | 14.3 | 10.2 | 9.7 | 9.1 | 6.5 | 6.1 | 6.1 | 6.0 | 6.6 | 6.7 | 6.2 | 6.0 | 5.9 | 5.3 |
| Switzerland | 19.0 | 19.2 | 13.6 | 13.9 | 9.9 | 8.7 | 8.3 | 8.4 | 8.2 | 8.3 | 7.6 | 7.1 | 7.5 | 6.9 |
| Turkey | - | - | 14.3 | 14.8 | - | - | - | - | - | - | - | - | - | - |
| United Kingdom | 11.9 | 11.0 | 9.4 | 9.4 | 6.5 | 6.4 | 6.4 | 6.1 | 6.1 | 6.1 | 6.1 | 6.0 | 6.1 | 5.6 |
| United States of America | 20.7 | 22.5 | 18.4 | 17.9 | 15.9 | 15.9 | 15.7 | 15.4 | 15.3 | 15.2 | 14.8 | 14.9 | 14.7 | 14.5 |
| **OECD median** | **18.5** | **17.0** | **15.1** | **14.8** | **12.3** | **12.5** | **13.4** | **12.4** | **12.0** | **11.6** | **11.5** | **10.8** | **9.5** | **9.5** |
| *New South Wales* | *26.1* | *25.2* | *19.5* | *13.7* | *10.1* | *9.4* | *9.2* | *8.8* | *9.0* | *9.3* | *8.0* | *8.5* | *8.1* | *7.6* |
| *Victoria* | *24.0* | *16.8* | *16.6* | *12.5* | *9.3* | *9.1* | *8.2* | *8.4* | *8.2* | *8.6* | *9.2* | *8.2* | *6.7* | *6.9* |
| *Queensland* | *31.0* | *24.6* | *19.5* | *13.8* | *14.0* | *11.5* | *10.6* | *8.1* | *9.0* | *8.9* | *8.9* | *8.7* | *8.2* | *8.0* |
| *South Australia* | *26.8* | *20.6* | *19.5* | *15.8* | *12.3* | *12.3* | *10.0* | *11.3* | *10.1* | *11.0* | *10.1* | *10.1* | *10.3* | *9.1* |
| *Western Australia* | *26.3* | *23.1* | *17.1* | *12.2* | *12.1* | *14.0* | *11.0* | *12.2* | *11.8* | *11.3* | *8.7* | *9.3* | *9.2* | *9.0* |
| *Tasmania* | *29.7* | *23.6* | *17.6* | *15.4* | *12.0* | *13.5* | *6.8* | *10.2* | *11.2* | *9.1* | *12.9* | *7.8* | *8.6* | *12.0* |
| *Northern Territory* | *68.9* | *53.3* | *45.1* | *41.5* | *34.4* | *39.6* | *32.1* | *36.3* | *25.4* | *26.1* | *25.3* | *27.7* | *26.7* | *17.5* |
| *Australian Capital Territory* | *16.1* | *13.4* | *13.1* | *9.2* | *4.9* | *7.5* | *5.5* | *7.1* | *6.1* | *5.7* | *5.0* | *3.1* | *3.4* | *2.8* |

*Source Australian Transport Safety Bureau*

Note: The discrepancy with Netherlands data compared to that within the report in section 3.71 and 4.2 is related to SWOV using data based upon real accident information rather than recorded data, which is not considered by SWOV to be fully accurate.