Australasian Road Safety Research
Policing and Education Conference 2006

“Emergency Services & Road Safety“

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Presentation Overview

1. The role of the Queensland Fire & Rescue Service (QFRS) attending Road Accidents

2. An introduction to the Australasian Road Rescue Organisation (ARRO)
Statistics

**RACQ Road Crash Statistics**
- 300 Queenslanders die each year
- 6000 seriously injured
- $3.9 billion cost to Queensland economy
- 2.8% of Queensland's gross state income

About QFRS

- 237 Urban Fire Stations
- 1550 Rural Fire Brigades
- 2000 full time
- 2000 part time
- 40000 Volunteers
- Attended 11800 road accidents last year
- Average of 800 motor vehicle accidents requiring extrication each year
- Road Awareness & Accident Prevention (RAAP) program delivered to over 30000 students each year
- Provides fire protection, scene safety and rescue services at accident scenes
S53 Powers of authorised office in dangerous situations
(1) An authorised fire officer may take any reasonable measure —
(a) to protect persons, property or the environment from danger or potential danger caused by a fire or chemical incident; or
(b) to protect persons trapped in any vehicle or building or otherwise endangered.

Equipment carried by QFRS
Monocoque
Majority of passenger vehicles are monocoque construction meaning one integral body and frame construction (each component relies on the next to give overall strength).

Ladder Chassis
Ladder chassis construction consists of two steel rails running the length of the vehicle and linked together by cross members. The body is fitted to the chassis as a separate component.
MONOCOQUE CONSTRUCTION

- bonnet crumples
- doors deformed
- boot deformed
- side intrusion bars in some vehicles
- lighter weight

MONOCOQUE CONSTRUCTION

Integral body/frame construction

Passenger compartment:
main structural component

Floorpan
LADDER CHASSIS CONSTRUCTION

Not as prone to crumple as a monocoque-type constructed vehicle, making gaining access easier. Found on older vehicles, most 4-wheel drives, trucks, buses, etc.

LADDER CHASSIS CONSTRUCTION

- No crumple zones
- Greater weight
- Occupants more prone to injury
- Steering column frequently driven into the abdomen/chest of driver
LADDIER CHASSIS CONSTRUCTION

Australasian Road Rescue Organisation

ARRO - The peak body in Australasia for the development of knowledge and skills in road rescue
What is ARRO?
- A 'Not for profit' volunteer organisation.
- Individual and corporate members drawn from road rescue agencies across Australia and New Zealand.
- Formed in 1996 to improve the general skills, knowledge and capability of road rescue providers.
- In excess of 6,500 hours per year toward improving the science of rescue
- A founding member and leading influence in the World Rescue Organisation (WRO).
What we do

- Research and Development;
- Technical Bulletins; and
- Training.

Australasian Road Rescue Organisation

What we do

- Annual Rescue Challenges and Learning Symposia
What we do

Interactive web site

Australasian Road Rescue Organisation

Welcome to the official Australasian Road Rescue Organisation (ARRO) website.

ARRO is the peak body in Australia for the development of knowledge and skills in road safety.

ARRO was established as the Australian Roadside Assistance Association in 1980 and ARMA changed its name to ARRO in 2002 to reflect our current status as the peak body in the roadside assistance industry. ARRO represents Australia on the council.

Through our involvement in numerous challenges, and knowledge of the road transportation, ARRO aims to improve the quality and safety of roadside services, and to share the knowledge that has been gained for the benefit of the industry.

ARRO is a membership-based organisation and we are an officially identified peak body for roadside assistance services. By joining ARRO, you gain immediate access to the resources that have been developed by the industry and by sharing the knowledge that has been gained through our involvement in numerous challenges.

ARRO promotes the skills and expertise within the industry through training programs and seminars, and through the sharing of information and knowledge.

Australia and New Zealand Road Rescue Providers

Approximately 800 accredited providers in Australia and New Zealand

*Primary provider, plus various private providers such as mines rescue services
Why are we doing this?

FOR EVERY 1 DEATH
there are
3 LIFE LONG DISABLEMENTS
and there are
10 MAJOR TRAUMA PATIENTS REQUIRING SURGICAL
INTERVENTION
and there are
30 CASES THAT REQUIRE MEDICAL CARE.
Prof. Murray MacKay, Birmingham University Accident
Research Centre UK.

AND ... There is one road trauma death every
26.9 seconds somewhere in the world OR 3205 people a day
OR 22435 a week (Source: WHO)

Australian Road Rescue Statistics
from Report on Government Services 2006 (ROGS)

(please note: this data is more restrictive than individual agencies provide)

Reported Road Rescue Incidents 2002 - 2005
Australasian Road Rescue Organisation

Australian Road Rescue Statistics
from Report on Government Services 2006 (ROGS)

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Reported Road Rescue Extrications 2002 - 2005

- NSW
- VIC
- QLD
- WA
- SA
- TAS
- ACT
- NT

2002 - 2003
2003 - 2004
2004 - 2005
**Integrated rescue**

- Multi agency road rescue teams
- Combined rescue and medical training
- Enhanced cross-skilling in both disciplines
- Increased hazard awareness for all personnel
- An effective scene management approach from a rescue commander who understands the medical imperatives and communicates effectively.

**Advances in vehicle design**

- 60's - Nader pins
- 70's - Seat belts
- 80's
  - SRS (both multiple and multi stage airbags)
  - Seat belt pre-tensioners
  - Crumple zones
  - Anti intrusion bars
- 90's
  - Lighter materials (high strength low alloy metals)
  - Structurally integrated windscreens & laminated side glass
  - More electronics and technology than on the Apollo moon mission rockets
Anti-intrusion Bars

Seat Belt Pre-Tensioners & ‘G’ Force Limits
Energy Deflection Systems

- All designed to assist with the 3 stages of deceleration

Rescue techniques and impact on vehicle construction

Basic rescue techniques used at road rescue incidents

Evolutions:
- Side removal / flap
  - Glass, doors, pillars
- Roof removal / flap
  - Glass, doors, pillars
- Dash roll / lift
  - Glass, doors, pillars, hinges
- Vehicles may be on wheels, side or roof, and involved with other vehicles or objects.
The need for more knowledge on passenger and heavy vehicles

- Ongoing changes in general vehicle design and function
- High Intensity Discharge (HID) headlights
- Hybrid vehicles increasing in numbers

New Car Construction
Rescue techniques and impact on vehicle construction

Construction materials and methods

- Materials
  - Increasing resilience, HSLA, Boron, Alloys, polycarbonates and composites.

- Construction
  - Traditional monocoque or chassis construction, combined with safety and crumple zones, and
  - Hydro forming, blanking and multi layering of materials.

- Glazing
  - Polycarbonates and multi laminates (rear and side).

Future trends in vehicle design

Traditional monocoque or chassis construction, combined with safety and crumple zones, and

Hydro forming, blanking and multi layering of materials.

ATSB-DOTARS / FCAI Rescuers Guide to Vehicles fitted with SRS

Valuable road rescue resource:
- Originally in hard copy version,
- Recent electronic version only, and
- Both versions limited in pictorial details to reference all SRS features.
Examples of current vehicle SRS technology and construction info

Issues faced by Road Rescue providers

Community expectations
- New vehicles, new technology, safer in an accident;
- Deaths, injuries and trauma will be reduced initially; and
- People shouldn't die in accidents because they are still trapped.

Vehicle design—current and proposed
- New construction materials and shapes are more difficult to cut with current rescue tool technology, replacement equipment costs will exceed $50M over the next 5 years Nationally; and
- New car technology (SRS & Hybrid Vehicles) present greater risks to rescuers.

Limited research availabilities
- Most focused on trauma aspects and medical intervention.
- Very little on effectiveness of rescue in relation to current and future vehicle construction and design.
The need for more knowledge on passenger and heavy vehicles

- Ongoing SRS developments in passenger and heavy vehicle industry

Positive impacts on our Service Delivery

Greater efficiencies in road rescue operations
- less risk, and time on scene
- improved patient recovery and survivability

A quantum shift toward better prepared road rescue agencies; able to implement techniques based on well planned and informed decisions.
Australasian Road Rescue Organisation

Questions?