

# SMOKE PLUME MODELLING



## SMOKE PLUME MODELLING

- Why do the fire services need capability in this area?
  - Fire Fighter Safety
  - Increased community expectations





## CURRENT ACTIONS

- Current steps being taken by fire services to improve the provision of information to the community:
  - Increased levels of employed expertise (eg, scientists and engineers)
  - Enhanced relationships with other agencies working in this area (eg, EPA, Health Department)



## CURRENT MODELLING

- Fire services currently use modelling at hazmat incidents for gases and vapours.
- Examples of models used include:
  - Aloha (gases and vapours)
  - Auschem (gases and vapours)
  - HPAC (chemical warfare agents)
- **Most fire services cannot model smoke plumes at structure fires**



## SMOKE CONTENTS

- Typically smoke from a fire contains a range of:
  - Toxic Gases
  - Airborne Particulates



## AIR MONITORING AT FIRES

- Fire services have instrumentation to monitor some toxic gases at structure fires. Examples include:
  - Carbon monoxide
  - Hydrogen sulphide
  - Hydrogen cyanide
  - Oxides of nitrogen
  - Volatile organic compounds
- Fire Services cannot identify particles in real time



## SMOKE PLUME MODELLING CURRENTLY AVAILABLE

- The Bureau of Meteorology can model smoke plume for rural wildfires.
- Some research being done to model smoke plume from urban fires.



## IMPORTANCE

The ability to model smoke plumes is assuming increasing importance

- Given safety and community concerns it will become a core activity for fire services
- Smoke plume predictions will become vital in assisting other agencies eg, EPA, DHS
- Provide information on areas near the fire that may need “protect in place” actions



## WHAT WE WOULD LIKE

A model where the following could be entered at a structure fire:

- Current weather conditions
- Fuel types
- Type of structure
- Area of fire

And obtain a reasonable prediction of smoke travel, smoke contents and areas likely to be affected

