



WHAKARATONGA IWI

**FIRE  
EMERGENCY**

NEW ZEALAND

9(2)a

## FIRE CASE STUDY

An example of the challenges of emergency response in Tāmaki Makaurau



## Why we are presenting this case study

- The remit of Fire and Emergency has grown since 2017, increasing the type and number of incidents we respond to.
- We attend an average of 23,396 incident per year across Tāmaki Makaurau (including fire, medical, transport, rescues and hazardous substances)
- Construction across our region is increasing the risk of fire
- Intensification and infill housing is challenging traditional access to property for fire and other emergencies
- Demands on water to accommodate growth means there is not always sufficient water for firefighting
- Roding interventions for safety and emission reduction impact on our ability to respond efficiently
- Current and future reform relating land management and water are likely to create further impacts

<https://www.youtube.com/watch?v=BtMmymOxdjc>

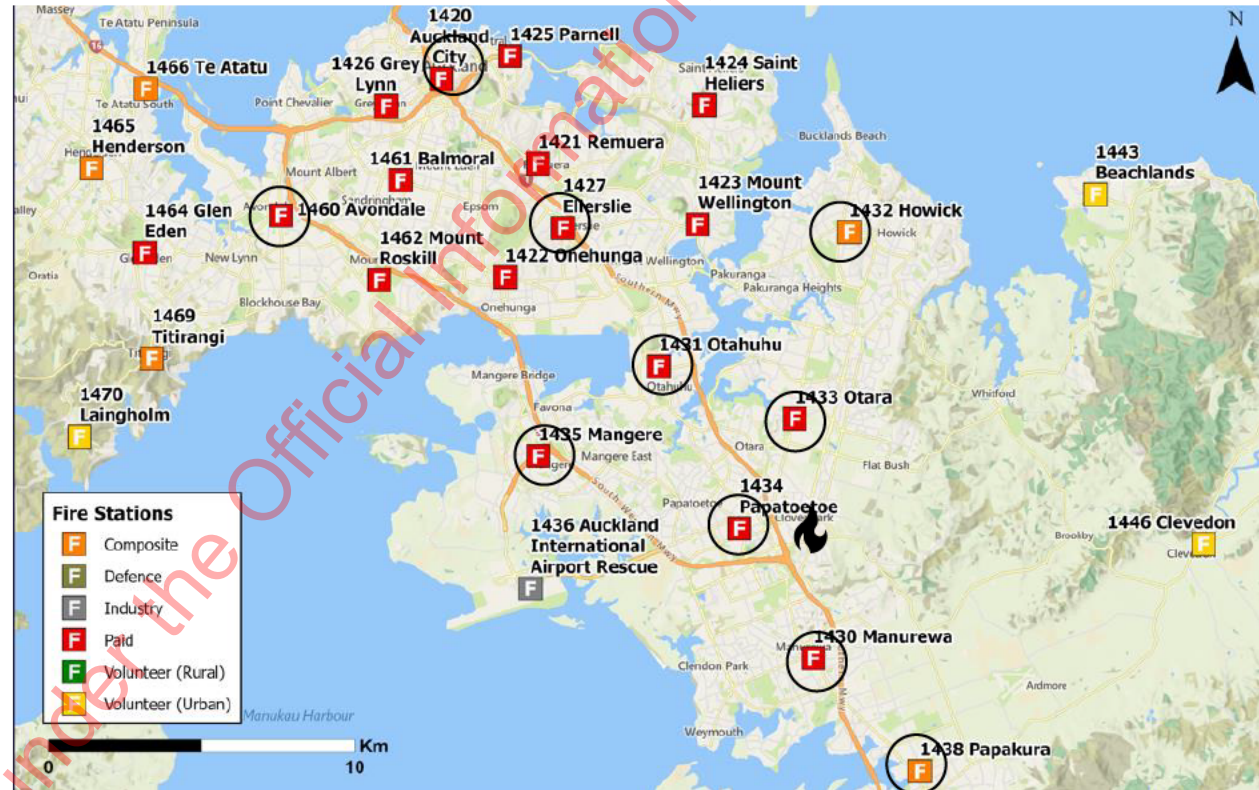
## Context

- On 7 April 2022 a fire occurred  
9(2)a
- Comcen received the report of the incident at 05:10hrs
- The first crew arrived at the incident at 05:17hrs
- The fire was brought under control at 06:31hrs
- The last fire appliance left the scene at 13:16hrs



# Incident and response

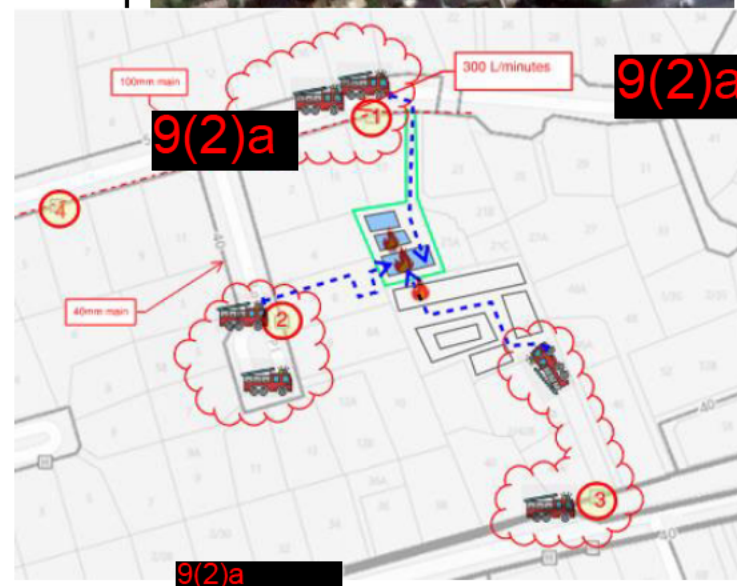
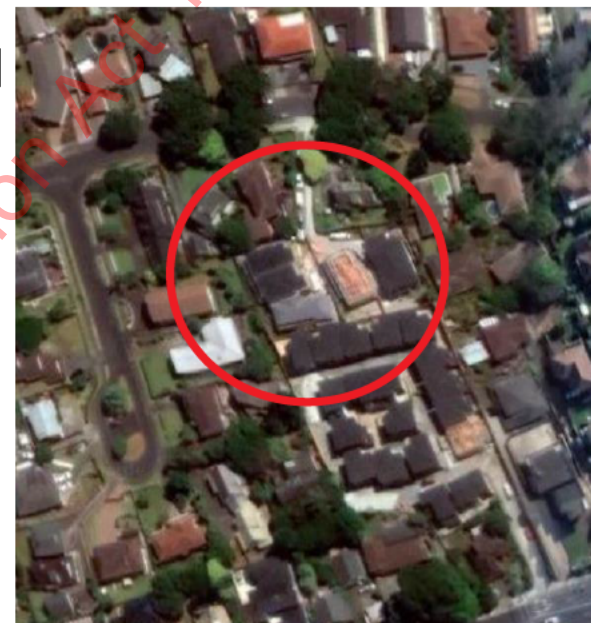
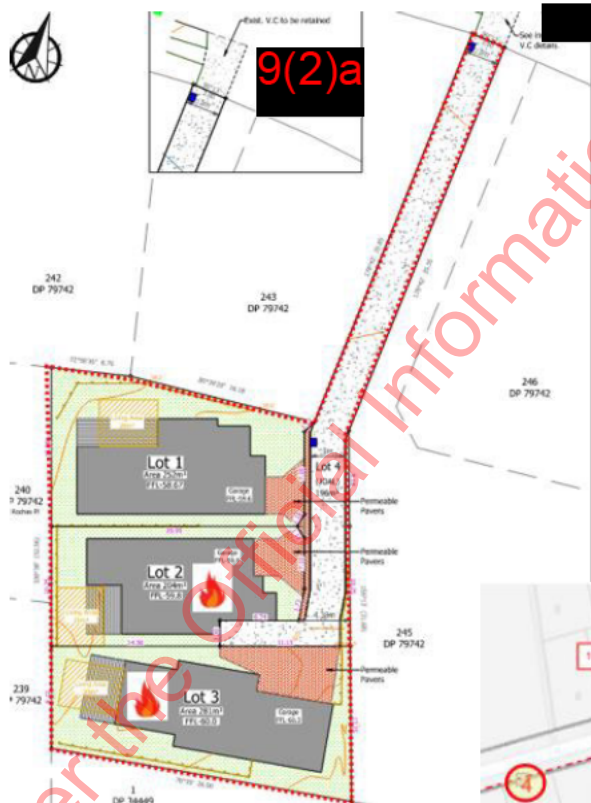
- 9(2)a is a residential area zoned Residential Mixed Housing Suburban.
- The fire was located at a building site for residential infill housing
- The cause of the fire is suspected arson
- There were no residents in the property, and no injuries to the public
- A firefighter received minor burns
- It was a 3rd Alarm fire, 15 appliances attended from 10 stations across 2 fire districts
- The property (a stand alone house) was completely destroyed, 3 other properties were severely damaged due to the heat of the fire.



# Issues faced during response

## Access to the incident was difficult

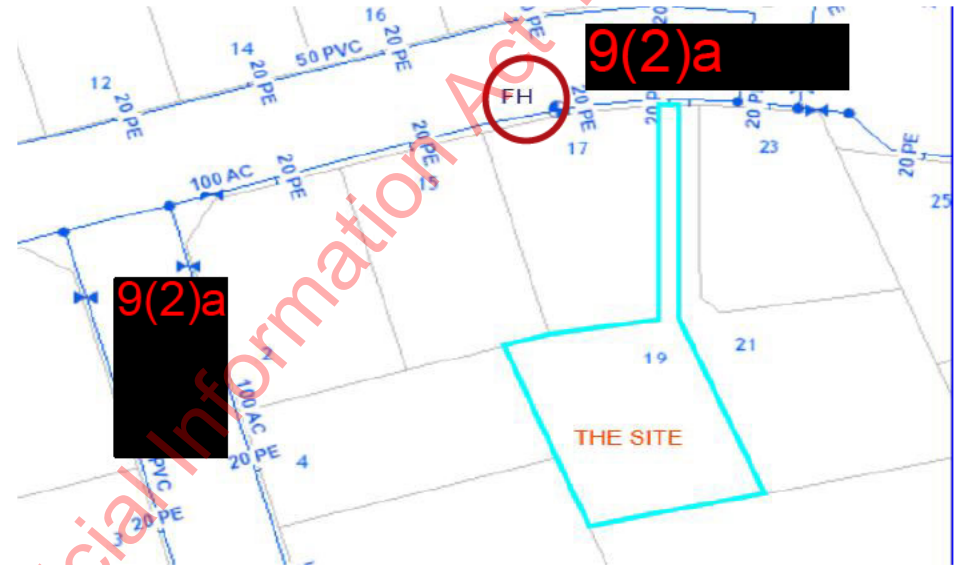
- Neither developments at 9(2)a [redacted] have adequate access for fire appliances, both have driveways that exceed 20m
- The driveway to access the property is over 40m in length, and 2.9m wide.
- The driveway for properties which back on to the house, 9(2)a [redacted] is 45m in length and too narrow for an appliance
- During the consent application it was determined that sufficient provision had been made for legal and physical access to the proposed allotments.
- While the Joint Owned Access Lot did not meet the 3.5m standard it met most requirements and could utilise the access way from 9(2)a [redacted]
- Firefighters accessed the fire by foot at 9(2)a [redacted], 9(2)a [redacted] and by breaking down a fence of a neighbouring property on 9(2)a [redacted]



# Issues faced during response

## Water supply for firefighting was insufficient

- Development connection was approved by Watercare. It assessed that there was network capacity to service the new properties and would achieve FW2 risk classification with 1500L/m flow total (750L/m from two hydrants)
- Engineering reports identifying that water for firefighting was ideally located at 9(2)a [REDACTED] and another at Rochas Place, 135m distance to the site measured in a straight line. Actual distance exceeded 270m.
- During the fire water flowing from the hydrant at 9(2)a [REDACTED] was insufficient for firefighting estimated to flow at only 300 L/m
- Firefighters connected to 3 hydrants creating a flow rate at best of 900L/m (in reality likely to be less due to the number of hydrants open)
- Minimum requirement for firefighting at this incident was 2000L/m due to the multiple exposure and fire spread to multiple buildings
- The engineer application to Watercare did not include evidence to support that the water supply would be adequate.
- Following the incident Watercare completed an audit of the main supply to 9(2)a [REDACTED]. Two valves were found to be nearly closed.



# Issues faced during response

## Development design created risk of fire spreading

- One dwelling was entirely consumed. The top floor of a second dwelling was extensively damaged
- Dwellings on the neighbouring property at Redoubt Road were also effected and the boundary fence severely damaged
- The level of destruction was due to wind direction, and short separation distance (1-3m between dwellings)
- The design complies with relevant boundary requirements for a single family unit dwelling (1m between building and boundary, 2m between any two buildings)
- It is fully compliant the Building Code – Acceptable Solution C/AS1. However a more thorough assessment would have not demonstrated compliance with Building Code cl. C3.6 – *in event of a fire received radiation at the relevant boundary does not exceed 30kW/m<sup>2</sup> or exceed 16kW/m<sup>2</sup> at 1m beyond the boundary*
- Incident radiation was estimated 57.858kW/m<sup>2</sup> at the boundary and 46.708kW/m<sup>2</sup> at 1m beyond the boundary
- Small separation distance on all sides of the building increase the risk of fire spreading. The difficult of access increases the time for fire to burn increasing the head radiation in a confined area.



# Impact

Approximately 0-2% of the cost of a residential dwelling is spent on fire protection

## Social impact

- **50 firefighters** put their personal safety at risk to extinguish the fire
- At least **4 family units** will not be ready for people to move into them (incurring stress and monetary costs)
- **Insurance administration** time and loss of business for developers

## Property and debris

- **4 properties** damaged. Average cost of a property in Auckland is over **1.2m**
- Over **20- 30 tonnes** of debris per full house. Costing **\$1,260 - \$3,780**

## Water

- It is estimated that over **180,000L** of reticulated water was used in extinguishing the fire. Costing **\$307,080**

## GHG Emissions

- Emissions for a complete fire loss of exemplar house is **27-38 tonnes** of Co2 Equivalent.
- GHG value estimate **\$1,702-\$2,395**
- **Does not include GHG emissions** from FENZ fire response activities





# Challenges

## Construction

There are on average over 1400 structure fire incidents across Tāmaki Makaurau per year

On average 5% are on building sites.

In 2022 so far there have been close to 30 fires at constructions sites, make up 7% of structure fires.

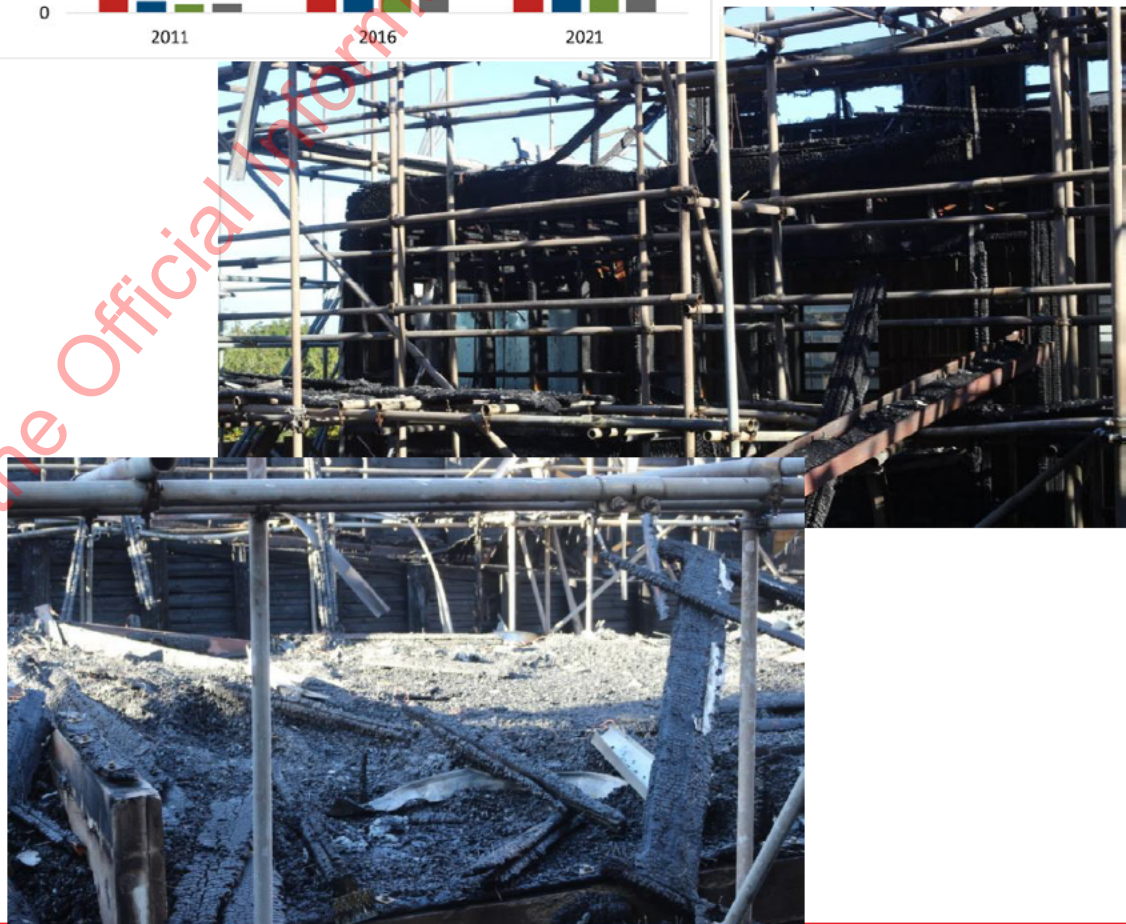
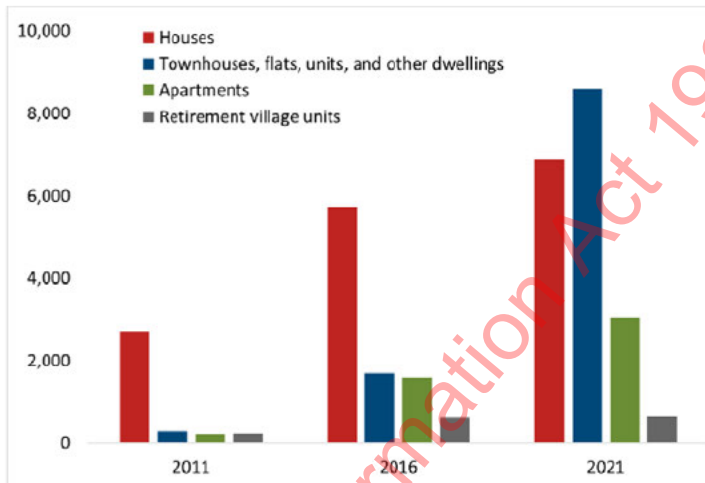
Large scale construction increases the potential for unwanted fires. This includes from:

- burning of rubbish
- sparks from welding
- timber and slag
- human error
- suspicious fires

Building sites are often vacant outside of working hours, increasing the risk that fires will not be reported quickly

Depending on the stage of construction there may be no alarm system or water for firefighting.

In buildings such as **9(2)a** the rate of fire development would be the same as completed structures, but the point at which it threatens other buildings and/or causes the house to collapse arrives sooner.



# Challenges

## Policy to enable growth

- Fire and Emergency’s Designer Guide outlines what is required for a fire appliance and firefighters to access sites in the event of an emergency. It is non-mandatory.
- Recent government changes to support growth such as the **National Policy Statement-Urban Development (NPS-UD)** and the **Enabling Housing Supply and Other Matters Act 2021** (the Act) do not consider the needs of emergency response in their objectives or outcomes sought.
- More varied housing typologies such as larger multi-unit development as well as a more compact urban form create new challenges for emergency services by way of access
- FENZ is facing increasing number of situations where access limited:
  - to hydrants is difficult due to cars parked on the roadway, as more people park on the streets,
  - to rear dwelling, at long sites where hose run lengths become an issue
  - on narrow streets where road widths are less than 4m.
- Local government, however cannot make provisions under the RMA for Firefighter or emergency response access, as it is provided for under the Building Code.



Dwellings consented by type, last 10 years



# Challenges

## Building Code

- To enable firefighters to get into buildings and move freely around their vehicles, under Clause C5.3 of the Building Code, buildings must be provided with access for fire appliances to a hard standing from which there is an unobstructed path to the building within 20m of:
  - the firefighter access into the building, and
  - the inlets to automatic fire sprinkler system or fire hydrant systems (where these are installed).
- C5.3 however exempts standalone dwellings, to developments such as 19 Derrimore Heights so excess requirements do not apply.
- The Building Act allows for single family homes, such as 19 Derrimore Heights to only require a smoke alarm and be 1m from the property boundary.
- In this instance the 1m boundary resulted in:
  - destruction of the other properties at 19 and 21 Derrimore Heights
  - destruction of the retaining wall between 19 Derrimore Heights and 42 Redoubt road
- There are also limited access requirements for town houses and multi-story development. This is resulting in development that is inaccessible or takes significantly longer to access in the event of emergency.



# Challenges

## Water

### Discretionary compliance with best practice

- It is critical for Fire and Emergency that water supply infrastructure is in place prior to any development commencing and that this water supply has adequate capacity and pressures available to service future growth.
- Adequate capacity and pressure for each development can be determined through the New Zealand Fire Service Firefighting Water Supplies Code of Practice SNZ PAS 4509:2008
- The Code of Practice, however is non-mandatory.

### Disconnect between different regulatory processes

- Resource consents process, building consents process and bylaw enforcement, creates gaps in ensuring adequate water supply to new developments.

### Network capacity

- Reduction of water flow to reduce waste/leaking has the potential to reduce water flow for firefighting
- Even after fixing the hydrant at 9(2)a, flow is only 960L/m
- Connections that seek the inclusion of fire safety systems (sprinklers) have the greatest potential to prevent the spread of fire in closely located dwelling, townhouses or apartments. Their installation however have the potential to exceed network capacity.



SNZ PAS 4509:2008

Publicly Available Specification

## New Zealand Fire Service Firefighting Water Supplies Code of Practice

Superseding SNZ PAS 4509:2003

SNZ PAS 4509:2008

# What has been done to address challenges



## Working with Council

- Fire and Emergency has been working with Council planners on planning rules related to the removal of minimal carparking and pedestrian only access developments. But Council cannot take emergency response into consideration under the RMA
- Fire and Emergency Design Guide may be including with Councils Design Guides
- Fire and Emergency and Auckland Emergency Management (AEM) are working together to support communities to be aware of their risks

## Working with Watercare

- Water Supply and Wastewater Network Bylaw 2015 and AUP Standard Conditions Manual includes reference to the Code of Practice, and therefore can be used by Watercare as a requirement for connections.
- Watercare completed an audit of the main supply to Derrimore Heights. The hydrant outside of 17 Derrimore Heights may have been faulty or seized and will be replaced.
- FENZ now has a direct line to a 24/7 contact at the Watercare Nerve Centre, should water flow at future incidents be insufficient
- FENZ staff visited the Watercare Nerve centre to gain a better understanding of the network monitoring and reporting system.

## Working with Auckland Transport

- Fire and Emergency provides feedback on all major transport strategies, and bylaws (i.e. Parking Strategy).
- We have recently provide GIS layers of emergency response routes to support more strategic planning around access.
- We are working to understand the impact of different roading interventions on emergency response.

## Working with Communities

- Community Readiness and Recovery Advisors provided letter drops to at risk areas to encourage residents to have an evacuation plan and working fire alarms.
- At home fire safety visits are available and promoted on social media
- Fire Awareness and Intervention Programme with children and young people to stop young people playing with fire
- Risk Reduction Advisors provide advice to developers on best practice
- Fire and Emergency and AEM work together to help communities in resilience planning to prepare for emergencies.

# Additional opportunities



## Working Central Government

- Advocate for greater incorporation of the Firefighting Water Supplies Code of Practice into the 3 Waters Reform
- Advocate for incorporation of the Firefighting Water Supplies Code of Practice into the RMA reforms (NBA)
- Advocate for regulation through the RMA the requirements to ensure adequate access for firefighting and emergency response, in line with FENZ Designers Guide (beyond what is provided for in the Building Act)



## Working Local Government

- Advocate to Watercare to apply the Firefighting Water Supplies Code of Practice to all requested connections and ensure acceptance is based on evidence
- Encourage council to include consideration of emergency response in submissions on reform, particularly any further feedback on Three Waters or RMA reform
- Encourage council to include consideration of emergency response lens in its approval of strategy, policy and planning related to growth
- Encourage council to ensure its developments, or development it supports through partnerships or incentives (i.e. through the Affordable Housing work programme) applies the FENZ Designers Guide as best practice.
- Encourage the Urban Design Panel to use an emergency response lens during design reviews.



## Working with Communities

- Improve knowledge of home buyers to identify and understand the risks associated with different building designs so they make informed decisions
- Encourage hard wired smoke alarms
- Work with local boards, AEM and communities to advocate for safe and accessible developments

