

JOURNEY MAP URBAN FIRE - ILLUSTRATIVE SCENARIO (Hypothetical)

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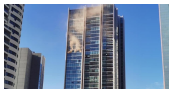
Major high rise structure fire within CBD (Hypothetical scenario)

A hypothetical fire has started in an apartment block in the CBD. Agencies on scene include Fire, Police and Ambulance. There is network connectivity to sites being used for BAU activities and public access - meaning first responders are having trouble using their internet dependent devices like mobile phones. In addition, limitations with IBC make communications difficult with crews and command points.

SETTING THE SCENE

1.5 HOURS INTO EVENT

The fire quickly spreads fire. Stores up the outside climbing fire services, Police, and Ambulance crews operate within a small area on the street outside the fire is critical. The crews urgently need to share situational awareness, which includes establishing the video streams of the incident back to the control room. This information is critical to managing the risks to Fire Crews, other first responders, and the general public as well as containing the fire.



High Pressure

Low pressure

2 HOURS

"A solution is needed right now. We've got gear out of that garage strong and about an hour away. And we've also got gear from further away."



The fire crews realize they cannot connect their mobile devices to stream videos, so they contact central fire communication centre (Fire Comm) to say: "Comms isn't working". Fire Comm then notify the Ops Comm team and headquarters to get them working on a solution. There is no further information to pass on - just that the Comms isn't working. The on-field teams are focused on the critical task of fighting the fire and saving lives and cannot provide additional diagnostic information.

"Having ongoing two-way information flow with the Incident Management team is critical. You need to get information from them and continue to feed them with information."



8 HOURS

At this stage, it becomes apparent that the incident will last longer than first thought. It's going to go on for up to a week. This means a shift in location for some or all of resources deployed. Also, staff will be rotating between shifts. The fire expands down the street - within damage assessment is already happening at some parts. One local MND network provider is completely out. And the remaining networks are totally congested.



"The early stages of an incident are very volatile. But as the incident progresses, our data usage increases - we start to bring in drilling, mapping, or communications with the outside world [social media, emergency services etc]."

2 DAYS

Even when the incident is over from a Fire Services perspective, there's a significant recovery and investigation phase. The Police take over - and many more other agencies are on site to support recovery.



"It's not a case of the incident's over - and then we switch into D-Phase. It's a case of 'We know where the incident is going to be over so we start laying the groundwork, doing the prep required to pick it up'."

"Once the equipment has been serviced, cleaned, refilled, checked or whatever else is needed - it will be put back on the shelf with a nice shiny tag and it says 'It's good to go'."

Event
Event type: Severe event
Duration: 48 hours + 1 week recovery time
Urgency of need: Critical ASAP
Criticality: Critical CBD daytime
Geography: Urban CBD
Environment: High Rise Building
Access: First Responder access only

Coverage
Temporary Coverage required: No in building coverage and congestion on MND networks
Agencies at the scene: Fire, Police, Ambulance
Capability range: 50 meters in building
Connections required: Up to 100

Asymms
BAU: Business as usual
CM: Call on Wireless
IBC: In building coverage
LMS: Location Based
MND: Mobile Network Operator
OC: Operational Communications
PMS: Public Safety Mobile Broadband

Disclaimer for Illustrative Phases: Phases used are for illustrative purposes only and are based upon the IBCP v1.0.

WHAT OPERATIONAL CONCERNS ARE DOING

DIAGNOSTICS

Assess all the information to determine the factors that will shape the response.
Operational Concerns:
1. The fire
2. The fire
3. The fire
4. The fire
5. The fire
6. The fire
7. The fire
8. The fire

SOLUTIONING

Review diagnostics to formulate an initial response.
Operational Concerns:
1. The fire
2. The fire
3. The fire
4. The fire
5. The fire
6. The fire
7. The fire
8. The fire

GETTING TO EVENT

Gather assets and learn to the site.
Operational Concerns:
1. The fire
2. The fire
3. The fire
4. The fire
5. The fire
6. The fire
7. The fire
8. The fire

INITIAL SETUP

Put in place and activate an initial solution.
Operational Concerns:
1. The fire
2. The fire
3. The fire
4. The fire
5. The fire
6. The fire
7. The fire
8. The fire

VALIDATE AND INTEGRATE INITIAL SOLUTION

Ensure solution works and the operation can run the equipment.
Operational Concerns:
1. The fire
2. The fire
3. The fire
4. The fire
5. The fire
6. The fire
7. The fire
8. The fire

MAINTAIN

Keep equipment up and running.
Operational Concerns:
1. The fire
2. The fire
3. The fire
4. The fire
5. The fire
6. The fire
7. The fire
8. The fire

REVIEW AND ADJUST

Monitor conditions and optimise the solution as needed.
Operational Concerns:
1. The fire
2. The fire
3. The fire
4. The fire
5. The fire
6. The fire
7. The fire
8. The fire

CONTINGENT INTEGRATION WITH OTHERS EVENT

Align with the team in charge of operation and other service providers.
Operational Concerns:
1. The fire
2. The fire
3. The fire
4. The fire
5. The fire
6. The fire
7. The fire
8. The fire

DEMORBILISE

Pack down assets and transport them from the site.
Operational Concerns:
1. The fire
2. The fire
3. The fire
4. The fire
5. The fire
6. The fire
7. The fire
8. The fire

OFFLINE MAINTENANCE

Ensure equipment is ready for the next deployment.
Operational Concerns:
1. The fire
2. The fire
3. The fire
4. The fire
5. The fire
6. The fire
7. The fire
8. The fire

INCIDENT REVIEW

Debrief and identify opportunities to improve.
Operational Concerns:
1. The fire
2. The fire
3. The fire
4. The fire
5. The fire
6. The fire
7. The fire
8. The fire

CHALLENGES AND SUCCESS FACTORS

Pressure of performance
Limited resources
Communication
Coordination
Data management
Network congestion
Equipment failure
Weather conditions
Public safety
Time constraints

Clear communication
Proper training
Well-maintained equipment
Good coordination
Effective leadership
Strong teamwork
Clear roles and responsibilities
Regular updates and status reports

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JOURNEY MAP

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The following scenario is hypothetical only and is meant to reflect the typical issues faced by an urban Fire Services agency in any jurisdiction across Australia for this type of incident. The actual practices and devices used by the relevant agency in individual jurisdictions in a similar situation may vary.

Major high rise structure fire within CBD (Hypothetical scenario)

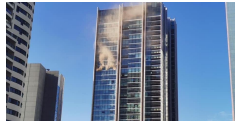
A hypothetical fire has started in an apartment block in the CBD. Agencies on scene include Fire, Police and Ambulance. There is network contention due to sites being used for BAU activities and public access - meaning first responders are having trouble using their internet dependent devices like mobile phones. In addition, limitations with IBC make communications difficult with crews and command points.

SETTING THE SCENE

1.5 HOURS INTO EVENT

The fire quickly spreads five storeys up the outside cladding. Fire Services, Police, and Ambulance crews operate within a small area on the street outside; time is critical.

The crews urgently need to share situational awareness, which includes establishing live video streams of the incident back to the control room. This information is critical to managing the risks to Fire Crews, other first responders, and the general public - as well as containing the fire.



2 HOURS

"A solution is needed right now. We've got gear at a third-party storage unit about an hour away. And we've also got gear even further west."



"The crews are crying out for a solution to the communication problems. They are frustrated by not being able to use their devices. Every little distraction adds up and can remove the crew's focus from the critical situation."

The fire crews realise they cannot connect their mobile devices to stream videos, so they contact central the central Fire Communication centre ('Fire Comms') to say: "Comms isn't working".

Fire Comms then notify the Ops Comms team at headquarters to get them working on a solution. There is no further information to pass on - just that the Comms isn't working. The in-field teams are focused on the critical task of fighting the fire and saving lives and cannot provide additional diagnostic information.

"Having ongoing two-way information flows with the Incident Management team is critical. You need to get information from them and continue to feed them with information."



High Pressure

URGENT

HECTIC

Low pressure

Event

Event type: Severe event
Duration: 48 hours + 1 week recovery time
Urgency of need: Critical ASAP
Civilians: Central CBD daytime
Geography: Urban CBD
Environment: High Rise Building
Access: First Responder access only

Coverage

Temporary Coverage required: No in building coverage and congestion on MNO networks
Agencies at the scene: Fire, Police, Ambulance
Capability range: 50 meters in building
Connections required: Up to 100

Acronyms

BAU: Business as usual
COW: Cell on Wheels
IBC: In-building coverage
LMR: Land Mobile Radio
MNO: Mobile Network Operator
OC: Operational Communications
PSMB: Public Safety Mobile Broadband

WHAT OPERATIONAL COMMS ARE DOING

DIAGNOSTICS
 Assess all the information to determine the factors that will shape the response.

Operational Comms - is advised that there has been an urgent request for comms support at a fire. They then:

1. Look at the LMR Dashboard and/or speak with the LMR Operator
2. Look at MNO coverage maps to see if there are blackspots in the area.
3. Try to find out if there is an MNO outage or degraded service
4. If possible, contact any on-site technicians for further information.

SOLUTIONING
 Review diagnostics to formulate an initial response

Once the key problems to be solved have been identified, **Operational Comms** will:

1. Undertake troubleshooting
2. Come up with an initial plan
3. Contact Fire Field Services team to discuss the plan - and find out if the equipment is available and get their input to the plan (including whether the equipment needed is available)
4. May contact LMR Operator if additional support is needed for the LMR network.

GETTING TO EVENT
 Gather assets and team to the site

Once an approach is agreed, **Operational Comms** will:

1. **Locate and access equipment** - mostly located at main storage location but, but may be at other sites. To do this, need to determine:
 - a. Where the equipment is located.
 - b. Ensure it is operationally ready (serviced, charged etc); and
 - c. Any access protocols.
2. **Get equipment to the event.**
 - a. Secure ready access to the assets - ensuring transport of assets is not delayed;
3. **Get a deployment crew with people who can set up the equipment to the event.**

INITIAL SETUP
 Put in place and activate an initial solution.

The deployment crew will **determine safe access and location** for assets to be deployed:

1. **Set down equipment** (e.g. COW from the truck)
2. **Set up equipment at the event:**
 - a. Find a power source (if needed, e.g. generator)
 - b. Ensure the solution is secure
 - c. Set up the **Key Coverage Asset** (such as a COW)
 - d. Set up any **Additional Coverage Extension** technology required such as MESH/Directional Antennas

VALIDATE AND INTEGRATE INITIAL SOLUTION
 Ensure solution works and the operation can use the equipment

Once set up, the team deploying the assets will:

1. **Ensure the solution is working as intended.**
2. **Liaise with Incident Commander** and work with them to integrate into the Incident Accident plan. At this stage, they let them know what they've done and how best to use the solutions that have been deployed.
3. **Ensure infield teams know:**
 - That the problem is resolved
 - Anything they need to do (such as how to connect to wifi) to get access to communications.

CHALLENGES AND SUCCESS FACTORS

Accuracy of diagnostics
 Operational Communications need detailed information about the issue to make sure they send the right solutions - but don't want to distract the in-field teams doing what they are doing.

Tracking - Availability of assets
 The ground team needs a solution ASAP - there is no time to waste locating available assets.

The range of solutions available
 Congestion in a high-rise urban area is difficult to resolve - as satellite is the most common means of resolution, and satellite doesn't work well amongst high-rise buildings.

Multiple Approvals/Parties Involved
 There can be extra complexity due to more parties needing to be involved/engaged in the process.

Asset governance
 In order to get access to the right assets in a timely fashion, it is important that there is:

- Proper equipment tracking - so that an asset's location can be readily determined by any authorised person at any time.
- Up-to-date maintenance logs - which ensure the equipment is serviced correctly and functioning - ready to work.
- Secure ready access to the assets - ensuring transport of assets is not delayed;

Storage locations
 The assets are required ASAP; any extra time in transit could impact the safety of the First Responders at the scene and the general public.

Ease of set up
 Set up is being undertaken under high pressure and is highly time critical - so ensuring assets are easy to setup is critical. Access permissions to the site for setup (First Responders access only) Access to the site and the placement of any equipment within the building can be a hazardous task so needs to be undertaken by properly trained personnel.

Power supply availability
 Power is likely out in any buildings - so independent power supply will be needed. **Asset Reidentification**
 There's heat from the fire and falling debris - so any assets deployed close to the incident need to be ruggedised.

In-building capability
 Coverage is required across multiple floors, stairwells and through walls.

Targeting of teams
 Fire crews are moving around in the building, and difficult to locate in order to validate they are connected

Ease to connect for end users
 The team are focused on fighting the fire; there is no time to troubleshoot with them.

8 HOURS

2 DAYS

POST-INCIDENT ACTIVITIES

At this stage, it becomes apparent that the incident will last longer than first thought. It's going to go on for up to a week. This means a shift in location for some or all of any solutions deployed. Also, staff will be rotating between shifts.

The fire expands down the street - whilst damage assessment is already happening at some parts.

One local MNO network provider is completely out. And the remaining networks are totally congested.



"The early stages of an incident are very voice-centric. But as the incident progresses, our data usage increases - we want to bring in drones, mapping, or communications with the outside world (social media, emergency alerts etc)."

Even when the incident is over from a Fire Services perspective, there's a significant recovery and investigation phase. The Police take over, and many more other agencies are on site to support recovery.



"At some point the incident transitions out of response into recovery. Recovery is about putting the community back together."

"It's not a case of the incident's over - and then we switch into D-Mode. It's a case of 'We know when the incident is going to be over so we start laying the groundwork, doing the prep required to pack it up.'"

"Once the equipment has been serviced, cleaned, refuelled, checked or whatever else is needed - it will be put back on the shelf with a nice shiny tag on it saying 'It's good to go.'"



DYNAMIC

CROWDED

MAINTAIN

Keep equipment up and running

Once in place solution may be left alone. Depending on the specific needs, the deployment team may stay onsite available to maintain the asset(s), including:

1. **Ensure the solution continues to have the power it needs.** (Infield solutions will keep generators fueled. Although sometimes this will be done by another agency if they are also refueling other generators.)
2. **Monitor solutions to ensure optimal outputs and resolve any issues**

This team may also provide broader Ops/tech support across the event as required (e.g. fix a radio that's not working).

Reliability / Resilience
The environment continues to be tough on any assets left at the event. So they need to be ruggedised.

Power supply, durability and maintenance for longer events
There is still no onsite power available - so needs to be able to operate from batteries or generators.

REVIEW AND ADJUST

Monitor conditions and optimise the solution as needed

The location of the fire has shifted, so the current solution is no longer optimal. In response to this, they will revisit the mix of assets - or potentially move assets including:

1. **Add more equipment** - this can happen if the size of the incident increases
2. **Optimise how the current solution works** - by revisiting the mix of assets to deliver a better service to in-field teams;
3. **Move the equipment on site** to a different location.

Adaptability
PSMB Must be readily scalable - and able to adjust to differing demands over time

Mobility (move asset locations)
The location of the fire may move. Foot, it may become harder to reach as the fire spreads. The assets must be easy to carry and maintain the connection.

Asset management
Temporary coverage assets may be required to be left at the scene over multiple days.

CONTINUAL INTEGRATION WITH ONSITE EVENT

Align with the team in charge of operation and other service providers

Throughout the event, the Operational Communications team will continue communication with In-Field teams to ensure the solutions are continuing to meet their needs and notifying them of any changes to the solution that has been deployed.

Also need to keep liaison with the Incident Management Team to stay ahead of any changes required.

Interoperability (across First Responders)
When there is multiple First Responders at an event like this one - and there typically is for medium to large events - they require communications to be shared (integrated) to ensure a seamless approach.

DEMORILISE

Pack down assets and transport them from the site.

1. **Operational Communications receive advice** that the incident is coming to an end via onsite comms or central command. The team starts implementing demobilisation plans to match that timeline.
2. **Once they know it's time to pack up** - they **break the gear down**. Get it ready to transport.
3. **The gear is then loaded onto trucks or into vehicles** to be returned to its rightful location(s).

Ease to pack up
Equipment needs to be located and accounted for; anyone should be able to pack it up.

Ease to transport back
Equipment needs to be located and accounted for; anyone should be able to pack it up.

OFFLINE MAINTENANCE WITH ONSITE EVENT

Monitor equipment is ready for the next deployment.

Ensure the equipment is maintained.

1. This includes cleaning, checking, and servicing (whether internal or external)
2. The unit is then tagged to say it's been serviced and is ready to go.

Ease of maintenance / servicing
The asset has been exposed to harsh conditions and bumped around for a week, so requires a thorough check. Any faults or issues need to be resolved to ensure operational readiness for the next incident

INCIDENT REVIEW

Debrief and identify opportunities to improve.

Incident Review - Incident review involving a debrief, and lessons learned documentation - which will include any issues with technology.

Historical Analytics
These are crucial for ensuring that learnings can be determined from each event to improve response times and capability for the future.