



In-Station Training

TM 24-10a Apartment Fire-Rapid Fire Progression



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Purpose

Flashover, backdraft, and smoke explosion are rapid fire progression phenomena that may be encountered during structural firefighting operations. In addition, explosion and fire or worsening fire conditions may result from leaking fuel gas such as natural gas or propane, and lithium-ion batteries in thermal runaway can increase fire intensity or result in an explosion. Incident commanders (both #1 and #2) need to understand these hazards and recognize cues that may indicate potential for these types of phenomena.

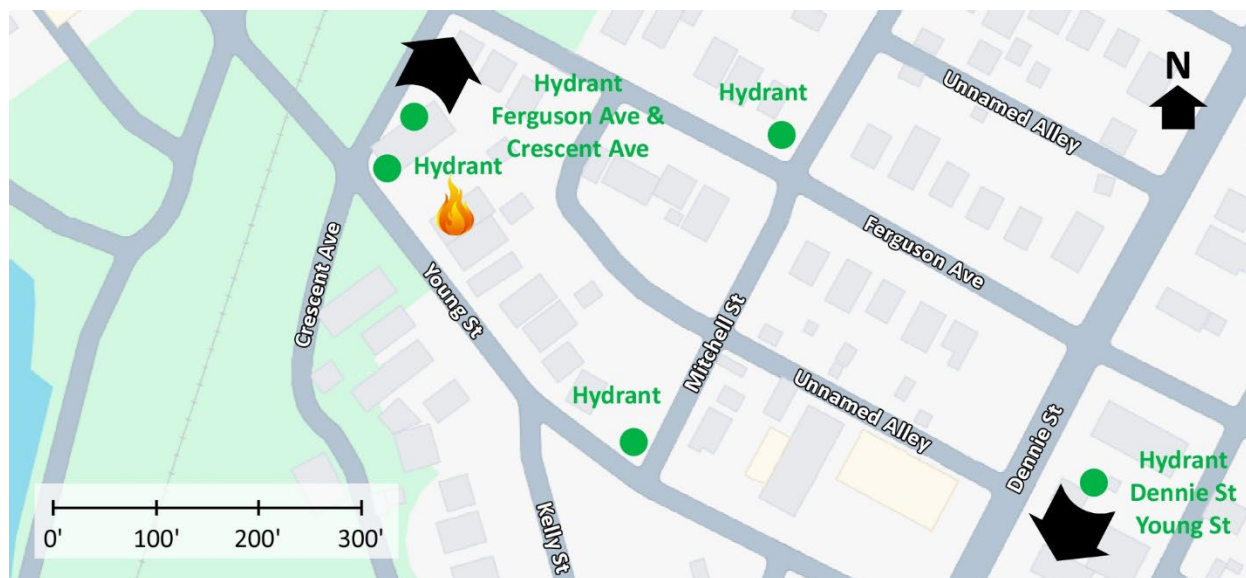
Learning Outcomes

Command officers perform effective ongoing size-up; select an appropriate strategy, and implement tactics based on the strategic decision-making model.

Conducting the Drill

This incident involved an apartment fire at 82 Young Street, Capreol, Ontario, Canada on January 24, 2024, at 19:28 (Papineau, 2024; Northern Ontario Online, 2024; & CBC News, 2024). Review the map and photos (Figures 1-7) to gain an understanding of the area and building involved.

Figure 1. Map of the Incident Area



Note: Adapted from Google. (2023a). [Map, 82 Young Street, Capreol, ON]. <https://bit.ly/3SAYTsj>.

There are hydrants on each end of the block surrounding the incident location as illustrated in Figures 1 and 2.

Figure 2. Aerial View



Note: Adapted from Google. (2023b). [Aerial view 82 Young Street, Capreol, ON]. <https://bit.ly/4beLKfv>.

Figure 3. Alpha/Bravo Corner



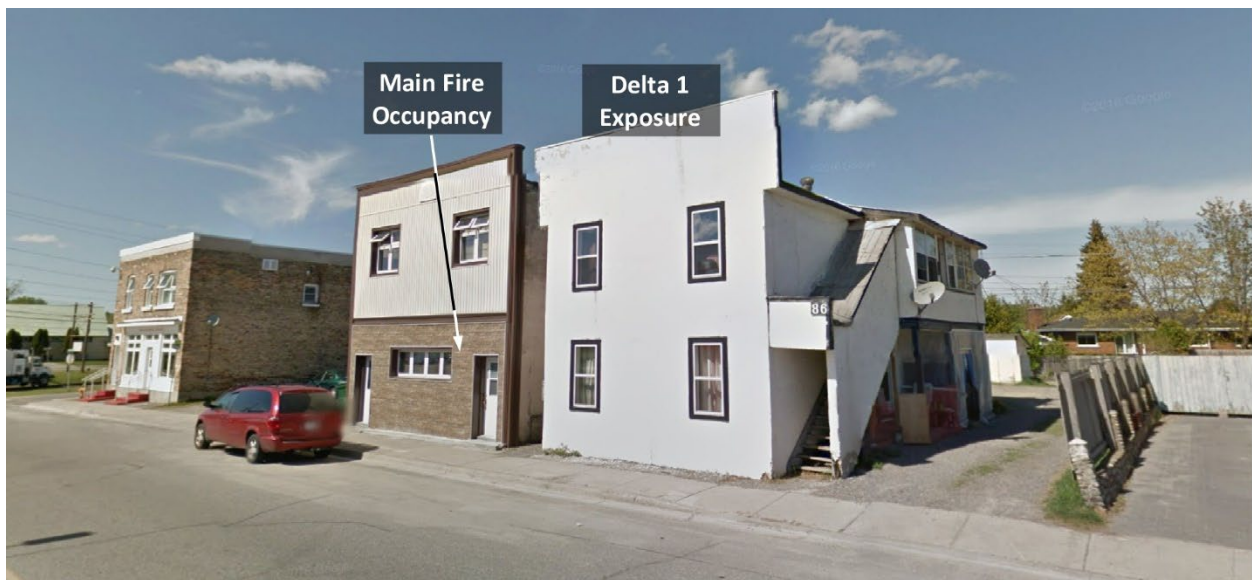
Note: Adapted from Google. (2014a). [Street view 82 Young Street, Capreol, ON]. <https://bit.ly/495Kols>.

Figure 4. Side Alpha



Note: Adapted from Google. (2014b). [Street view 82 Young Street, Capreol, ON]. <https://bit.ly/49cuFkA>.

Figure 5. Alpha/Delta Corner



Note: Adapted from Google. (2014c). [Street view 82 Young Street, Capreol, ON]. <https://bit.ly/48PhMgJ>.

Figure 6. Side Charlie



Note: Adapted from Google. (2014d). [Street view 82 Young Street, Capreol, ON]. <https://bit.ly/42d3MLf>.

Figure 7. Side Charlie



Note: Adapted from Google. (2014e). [Street view 82 Young Street, Capreol, ON]. <https://bit.ly/3u9T2k2>.

Important! This 10-Minute Training is based on the incident that occurred at 82 Young Street, Capreol, Ontario, Canada on January 24, 2024. However, the resource assignment and communications identified in this training have been designed to provide a specific learning context and may not fully match the events that occurred during this incident.

You have been dispatched to 82 Young Street for an apartment fire at 19:28. You are responding to this incident as the first arriving command officer. Temperature is 27° F with wind from the east southeast at 2 mph (Weather Underground, 2023). While responding you hear four engines, an advanced life support (ALS) ambulance, and a second command officer enroute. The engines have staffing typical of your agency.

While enroute, dispatch provides an update that the caller reports fire in the apartment building at this address. The first engine will arrive from the southeast on Young Street. The second engine and ALS ambulance will arrive from the same direction approximately three minutes after the first. Make a note of your resource and staffing assumptions prior to continuing with this 10-Minute Training. **You will arrive from the southeast on Young Street after the second company.** Additional resources on the first alarm (based on your response plan) will arrive later in the incident.

1. What critical factors would you consider when dispatched and during response?

As you were responding Engine 1 provided the following initial radio report:

On-scene of a small two-story fourplex with a working fire on Floor 1, Side Alpha, smoke from all sides. Dry forward lay from the hydrant at Young Street and Mitchell Street, stretching an attack line on Side Alpha for fire control, in the offensive strategy, give me two additional engines, establishing Young Command.

Young Command provides the following update report:

360 complete, two stories all sides, no basement, access to the units on Side Charlie from Bravo law enforcement reports that all occupants have evacuated the building, continuing offensive, Engine 1 is accountability on Side Alpha, continuing offensive.

Engine 2 and Medic 2 report Level 1 on a hydrant at Young Street and Mitchell Street. Young Command provides the following orders to Engine 2 and Medic 2.

Make Engine 1's hydrant connection, park out of the way, and stretch a second attack line off Engine 1, assist with fire control Side Alpha. Medic 2, integrate with Engine 2.

The video of this incident was taken from a drone, providing a somewhat different perspective than Chief 1 would have from ground level. Watch the [incident video](#) (Northern Ontario Online, 2024) from 00:40 to 01:00 and examine Figure 8 illustrating conditions on your arrival.

Figure 8. Conditions on Arrival of Chief 1



Note: Adapted from Papineau, C. (2024). Drone footage shows moment apartment building explodes, collapses in Greater Sudbury. <https://bit.ly/3OjCYDp>.

2. What actions will you take prior to contacting IC #1 (Engine 1) to begin command transfer?

3. State your command transfer communication after IC #1 acknowledges your radio contact (exactly as you would transmit it).

Following your confirmation of the location and assignment of Engines 1 and 2 and request for a conditions, actions, and needs (CAN) report, IC #1 provides the following CAN:

That is correct. Fire is knocked down, E1 working on gaining access to the main fire unit on Floor 1, Side Alpha, air status is $\frac{3}{4}$, Engine 2 will be stretching through Side Alpha to Floor 2 for primary search and check for extension on Floor 1, need an on-deck company and a primary search and check for extension in the units on Side Charlie

4. State the communication you would have with IC #1 and dispatch to complete the command transfer (exactly as you would transmit it).

5. What action would you take based on the CAN from Engine 1 (IC #1). State the communications you would have with the operating companies exactly as you would transmit them.

Engine 3 arrives and reports that they are Level 1 on a hydrant at Ferguson Ave and Mitchell Street.

6. State the tactical assignment that you will give Engine 3 exactly as you would transmit it.

Watch the [incident video](#) from 01:00 to 01:25 and examine Figures 9 and 10 illustrating the rapidly changing conditions in this incident.

Figure 9. Changing Conditions



Note: Adapted from Northern Ontario Online. (2024). *Apartment fire on Young Street in Capreol on January 24, 2024* [video]. <https://bit.ly/3urWBm2>.

Figure 10. Post Explosion Conditions



Note: Adapted from Northern Ontario Online. (2024). *Apartment fire on Young Street in Capreol on January 24, 2024* [video]. <https://bit.ly/3urWBm2>.

You do not receive any communication from Engine 1, Engine 2, or Medic 2. You observe firefighters on the ground, some of whom are moving, but cannot see all the personnel who were working on Side Alpha.

7. State the actions you would take and communications you would have (and with whom). State the radio communications exactly as you would transmit them.

If you attempted to communicate with the companies operating on Side Alpha, this effort was unsuccessful. Engine 4 arrives and reports that they are Level 1 on a hydrant at Dennie street and Young Street.

8. State the tactical assignment that you will give Engine 4 exactly as you would transmit it.

9. Chief 2 arrives and advises that they are Level 1. State the assignment you will give Chief 2 exactly as you would transmit it.

Watch the [incident video](#) (Northern Ontario Online, 2024) from 00:00 to 02:00. You may want to watch it several times before answering the next three questions.

10. Did you (as IC #2) leave your strategic command position (in the fire SUV) to assist with rescue of the firefighters trapped by the collapse? Why or why not?

11. What smoke, air track, heat, and flame (B-SAHF) indicators did you observe in the first 00:30 of the incident video? What conclusions do you draw from these observations regarding stages of fire development, burning regime (fuel or ventilation limited), and the effectiveness of tactical operations?

Examine Figure 11 which illustrates the two second interval from 01:17 to 01:19. Then watch the [incident video](#) from 01:15 to 01:30, pause the video at 01:17. Click through the video (play, pause, play, pause) stopping the video as many times per second as you can until you reach 01:19 and closely observe the B-SAHF indicators.

Figure 11. Rapidly Changing Conditions



Note: Adapted from Northern Ontario Online. (2024). *Apartment fire on Young Street in Capreol on January 24, 2024* [video]. <https://bit.ly/3urWBm2>.

12. What changes in B-SAHF indicators do you see in the video between 01:17 and 01:19? What fire behavior phenomena **may have** resulted in the explosion and subsequent collapse in this incident? What leads you to this conclusion? Are there other possible explanations for what occurred in this incident?

Additional Learning: If you have not established a login for the Underwriters Fire Safety Research Institute (UL FSRI) Fire Safety Academy, go to www.training.fsri.org and sign up for free. When you complete your profile, please select your department (e.g. East County Fire & Rescue) so we can track your professional development activity with the academy. If you already have signed up and created your profile, simply log in to access this additional learning. Choose the *Prerequisites for Live Fire Training Participants* (UL FSRI, 2024).



PREREQUISITES FOR LIVE FIRE TRAINING PARTICIPANTS



Learn foundational fire knowledge that
you can apply on the fireground to be
a safe and effective firefighter.

START COURSE

Complete (or review) the following lessons:

- Understanding Flashover
- Fire Flow Path
- Understanding Backdraft and Smoke Explosion

These three micro-lessons only take nine minutes to complete and are a great example of the new approach taken by UL FSRI Fire Safety Academy to provide learning in bite sized chunks.

While the Prerequisites for Live Fire Training Participants course is designed for recruit firefighters, these lessons are a great review of fire dynamics and related impact of tactical operations. If you have not already done so, take the time to complete the entire course!

References

- CBC News. (2024). *3 volunteer firefighters injured battling blaze in Capreol, Ont.* Retrieved February 15, 2024, from <https://bit.ly/42EiJWI>.
- Google. (2014a). [Street view 82 Young Street, Capreol, ON]. Retrieved February 17, 2024, from <https://bit.ly/495Kols>.
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- Weather Underground (2024). *Garson, Ontario, Canada weather history* [historical weather January 24, 2024]. Retrieved February 15, 2024, from <https://bit.ly/3HYMpVd>.