

An Update on Landfill and Recycling Industry Fires

presented by:
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Environmental Solutions **for More Than** 50 Years!

SCS ENGINEERS



Agenda

Industry Fire Trends

Fire Events

Fire Risk Pre-Plans

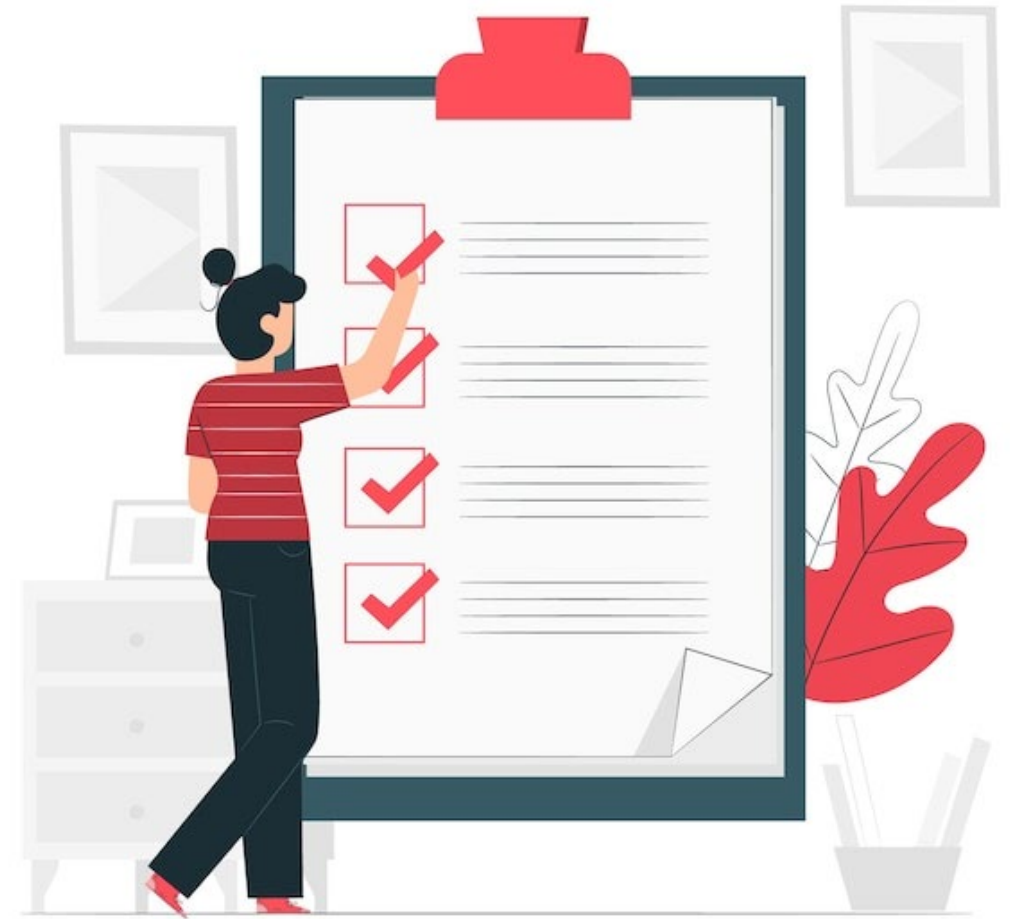


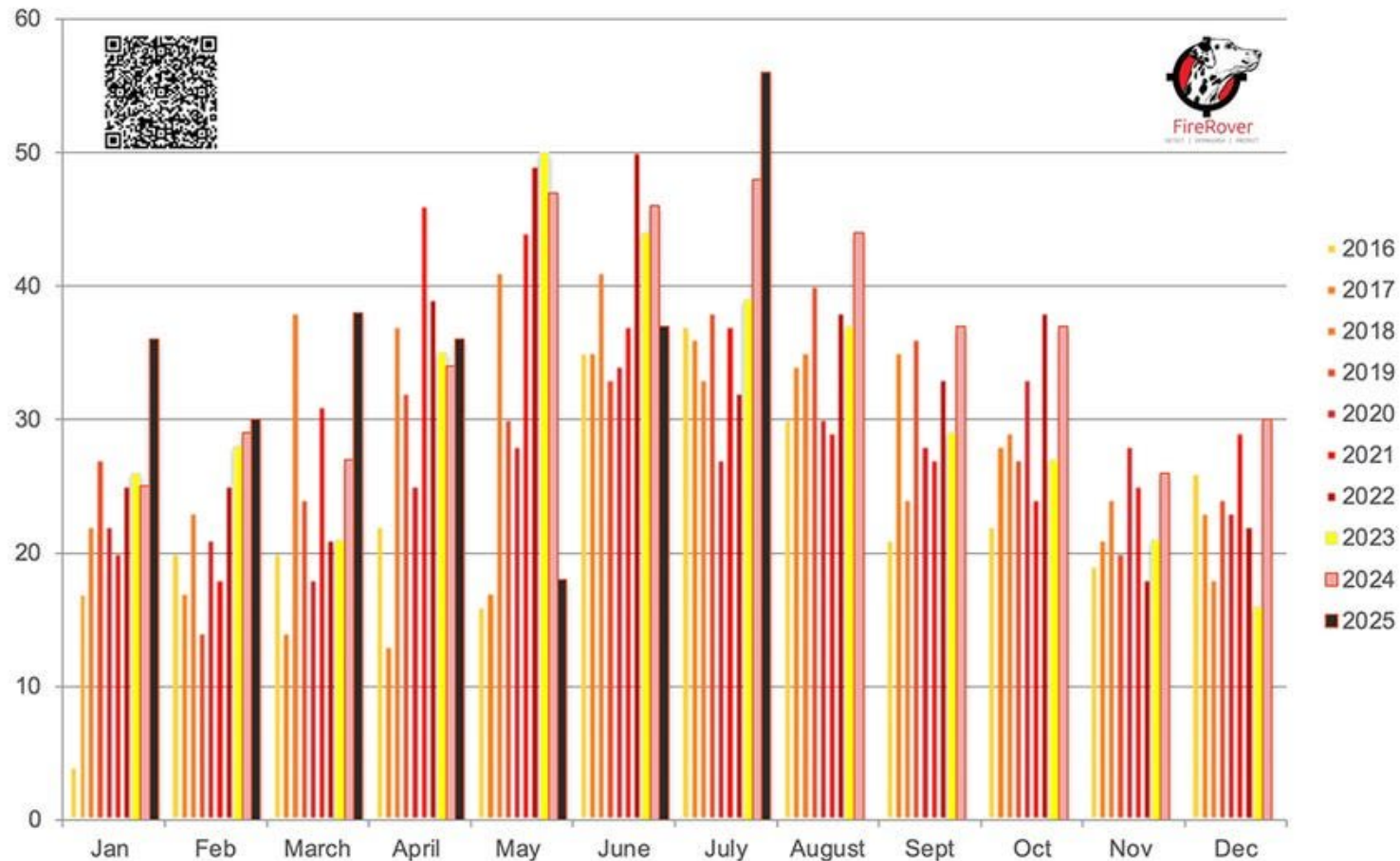
Image by storyset on Freepik

Fire Trends

- Not Uncommon
- Many go unreported (small working face fires)
- Average of 8,400 landfill fires are reported each year (National Fire Incident Reporting System)

Fire Trends

MONTHLY REPORTED WASTE & RECYCLING FACILITY FIRES US/CAN FEB 2016 – JULY 2025



Source: Ryan Fogelman, rfogelman@firerover.com

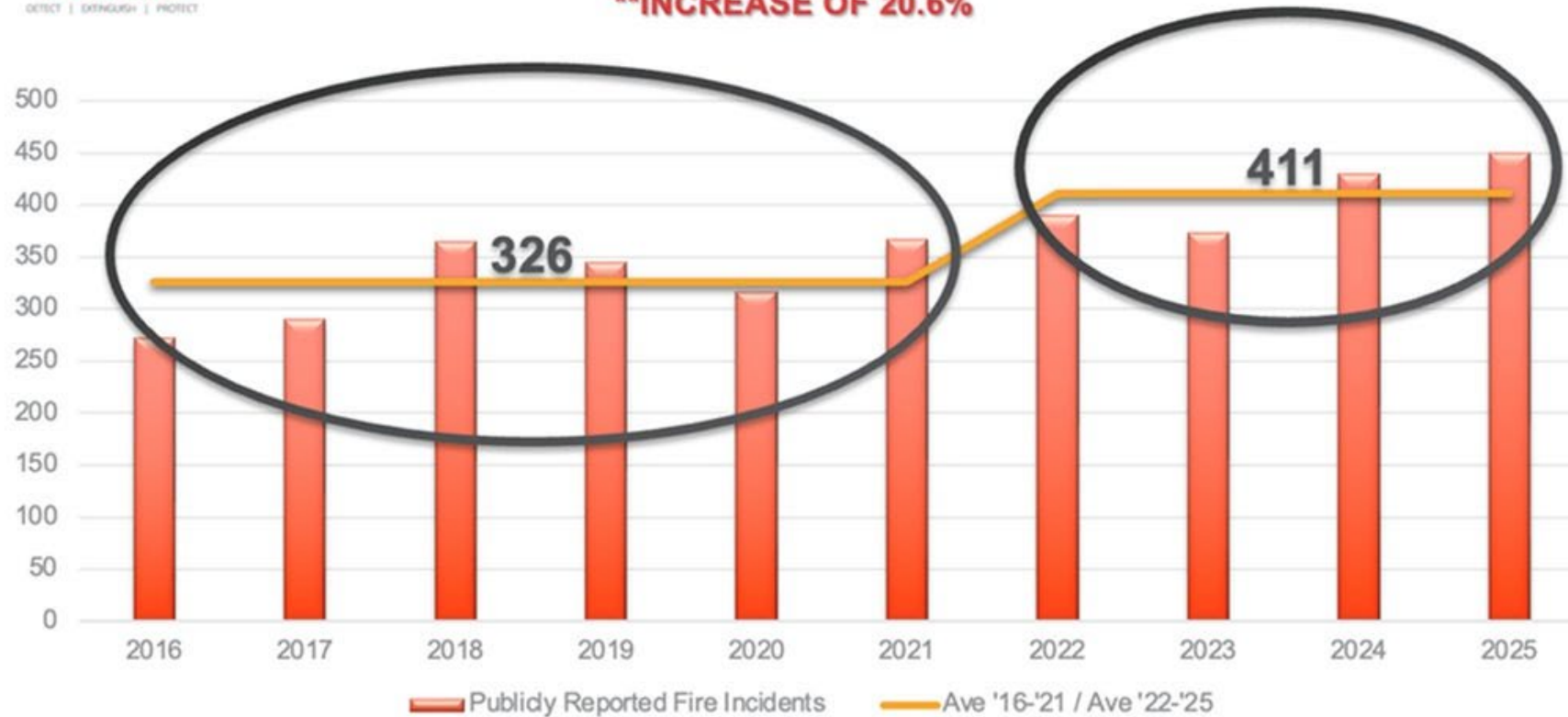
Fire Trends



THE VAPE EFFECT



AVERAGE FIRE INCIDENTS PER YEAR ('16-'21) VS ('22-'25)
**INCREASE OF 20.6%



Source: Ryan Fogelman, rfogelman@firerover.com

Fire Trends



2025 YTD PUBLICLY REPORTED FIRE INCIDENTS IN THE US/CAN VS. PRIOR YRS.

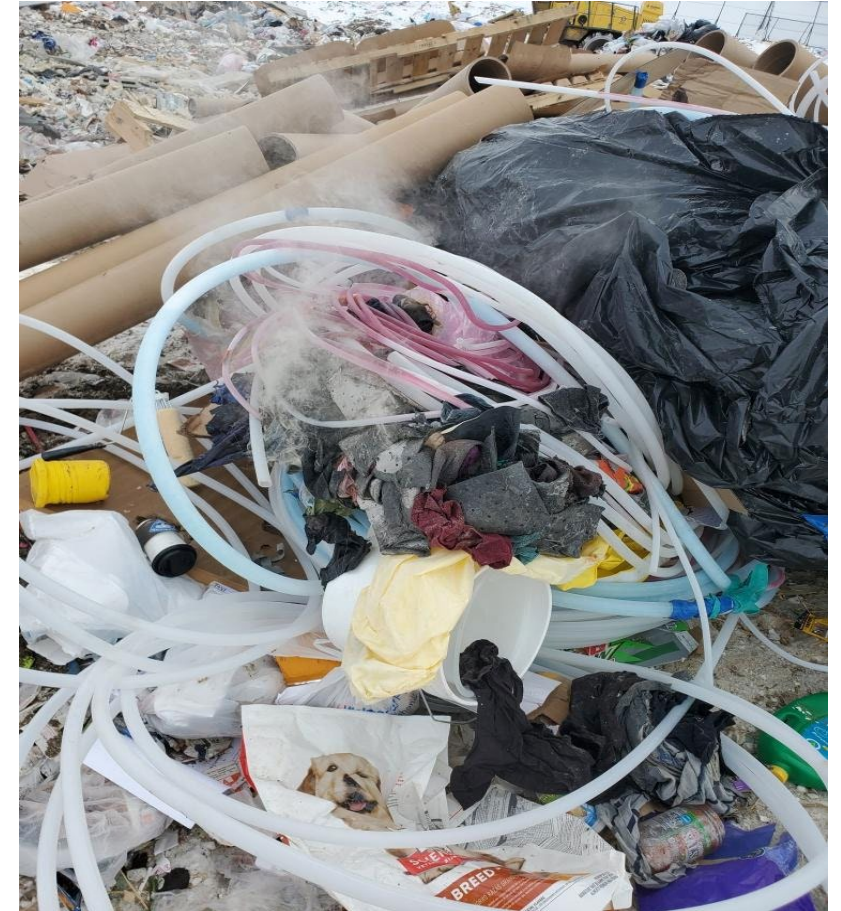
| Year | Publicly Reported Fires US/CAN | Year End |
|------|--------------------------------|----------|
| | January - July | |
| 2025 | 300 | NA |
| 2024 | 300 | 430 |
| 2023 | 280 | 373 |
| 2022 | 279 | 390 |
| 2018 | 270 | 365 |
| 2021 | 262 | 367 |
| 2019 | 238 | 345 |
| 2020 | 205 | 317 |
| 2017 | 183 | 290 |
| 2016 | 164 | 272 |

Source: Ryan Fogelman, rfogelman@firerover.com

Fire Trends

Fire Causes

- Traditional Methods
 - Waste reactions
 - Equipment sparks
- Lithium-ion Batteries
- Lightning
- Arson
- Poor Cover Operations
- Burn Barrel Management
- Previous Hot Loads
- Move In/Move Out Days at Colleges/Universities
- New Process/Staff at Manufacturing Facility



Fire Trends

Fire Causes

- Lithium-ion Batteries
 - Bluetooth headsets
 - Cell phones
 - Computer peripherals
 - Digital cameras
 - Game controllers
 - Laptops
 - Smartwatches
 - Smoke, fire, carbon monoxide detectors
 - Tablets
 - Vape devices

Examples of common electronic devices containing lithium cells or batteries

| | | | |
|---|---|---|---|
| Video cameras | Walkie talkies (2 way radio) | GPS devices | Radio controlled toys |
|  |  |  |  |
| Cameras | Scanner | Cellular Phones | MP3 players |
|  |  |  |  |
| Bluetooth headsets | Smartphones/mobiles | Laptop computers | Shavers |
|  |  |  |  |
| Power Drills | Tablets | Portable DVD players | Measuring equipment |
|  |  |  |  |

Fire Trends



Fire Trends



Fire Trends

Adjacent Operations

- Compost piles
- Containers
- Debris piles
- Equipment
- Structures
- Incoming vehicles



Fire Trends

“So what?”

“What’s the big deal? It’s just a dump fire.”



image: Freepik.com

Fire Trends

1 ton of MSW = 100 Gallons of fuel

600,000 ton/year facility

2,000 tons/day

206,000 gallons of fuel per day

That is about 17 fuel tankers per day...

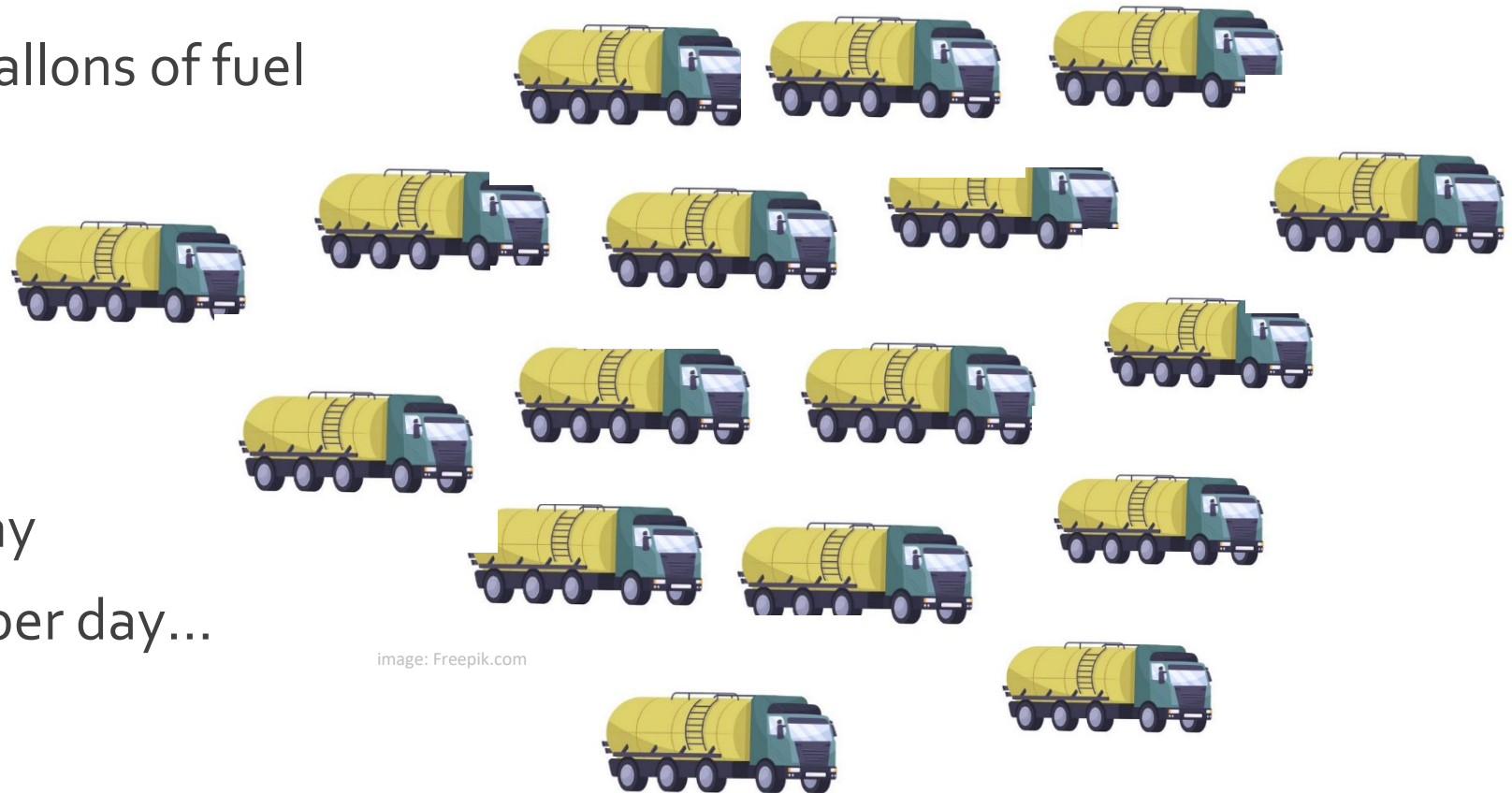


image: Freepik.com

Fire Trends

206,000 gallons/day = 61.6 million gallons/year

5,000 tanker trucks/year

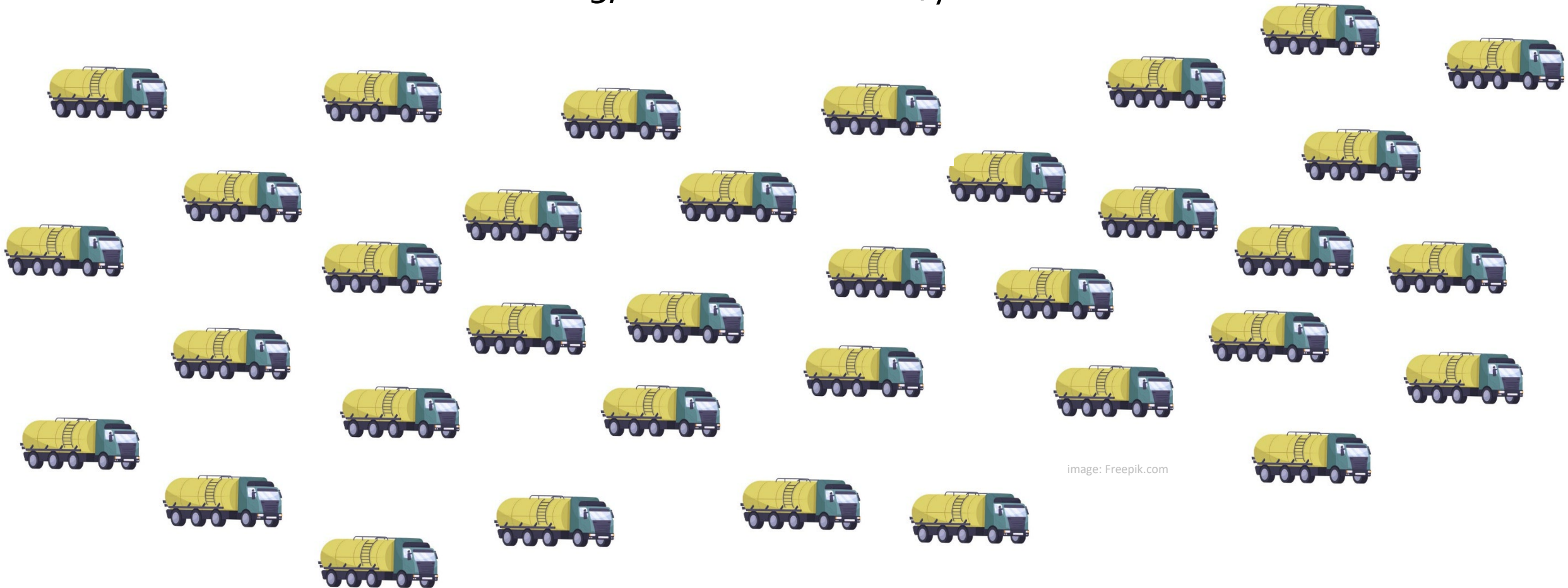


image: Freepik.com

Fire Trends



Fire Events



Fire Events

Key Takeaways – Iowa City Landfill (2016)



Fire Events

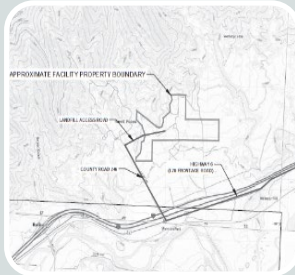
Key Takeaways – Iowa (2016) Landfills (Ongoing)



Joint safety meetings with landfill operators, staff, and FD



Knox-box with landfill gate and building keys



Have landfill site map printed and available



Maintain stockpile of cover soil



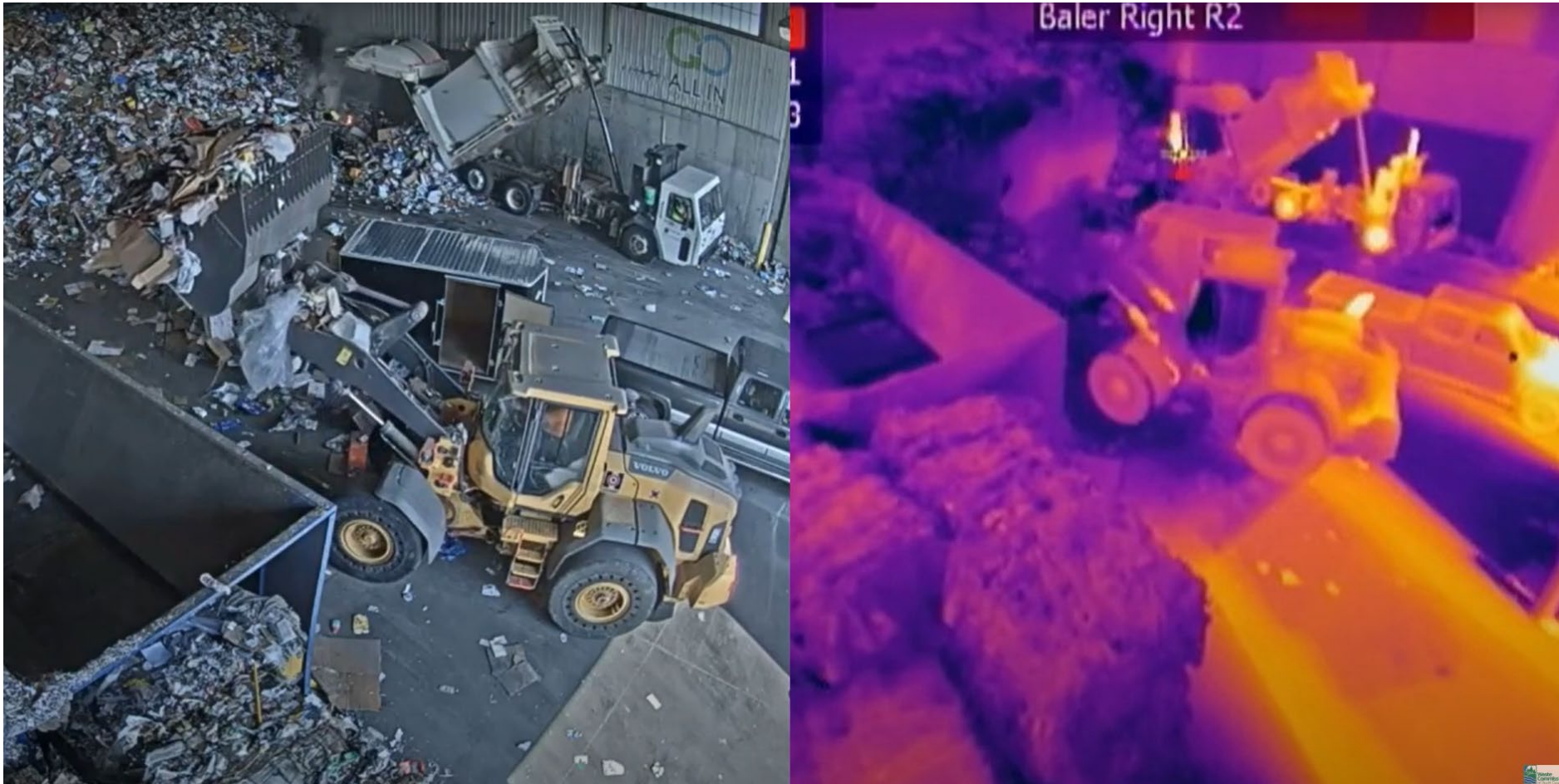
Emergency lighting and signage



Make sure FD pumper trucks are charged/ready before engaging with heavy equipment

Landfill Fire Events

Key Takeaways – Scott Area Recycling Center (2023)



Landfill Fire Events

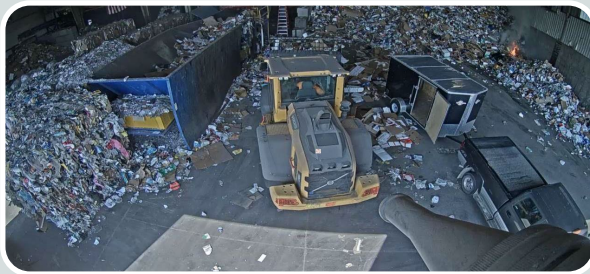
Key Takeaways – Scott Area Recycling Center (2023)

- 0:00 – First signs of smoke
- 0:20 – Fire Rover system alarm
- 0:39 – Visible fire
- 0:45 – Fire detected by staff
- 2:00 – Loader preparing to engage fire
- 2:47 – Fire Rover system activated
- 3:20 – Fire extinguishers used



Landfill Fire Events

Key Takeaways – Scott Area Recycling Center (2023)



IT communication
temporary
vulnerabilities



Identify and train
when to pull
burning material
away using
equipment



Debrief with fire
department,
emergency
vendor, and staff

Landfill Fire Events

Key Takeaways – Dubuque Metropolitan Area Solid Waste Agency (2022)

- 6:20PM – First signs of smoke
- 6:30PM – Visible flames
- 7:30PM – $\frac{1}{4}$ of Working Face on fire
- 8:00PM – FD On-site applying water
- 8:30PM – LF Dozer apply cover
- 9:30PM – Fire watch started

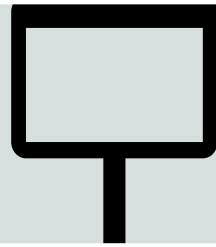


Landfill Fire Events

Key Takeaways – Dubuque Metropolitan Area Solid Waste Agency (2022)



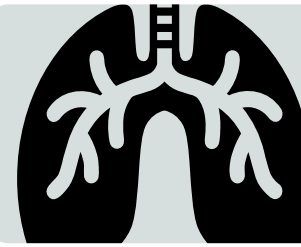
Detection and communication system operability and performance



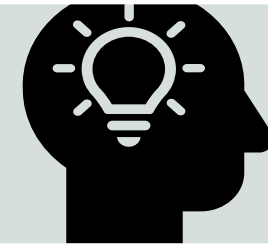
Directional signs for internal roads



Post event health screening requirements



Equipment operator protection



Coordinated activities and communication benefited from planning and training

Fire Events

General Takeaways

- Consistent communication between responders, facility staff, and emergency vendors
- How to isolate LFG system (who has authority to do so)
- Identify individual with authority to make decisions
- Educate public/customers about proper waste disposal, recycling practices, and fire risks their actions may present
- Maintain landscape around facility
- Design and maintain access roads for emergency vehicles
- Battery collection and recycling programs

Fire Risk Pre-Plans



Fire Risk Pre-Plans



Fire Risk Pre-Plans



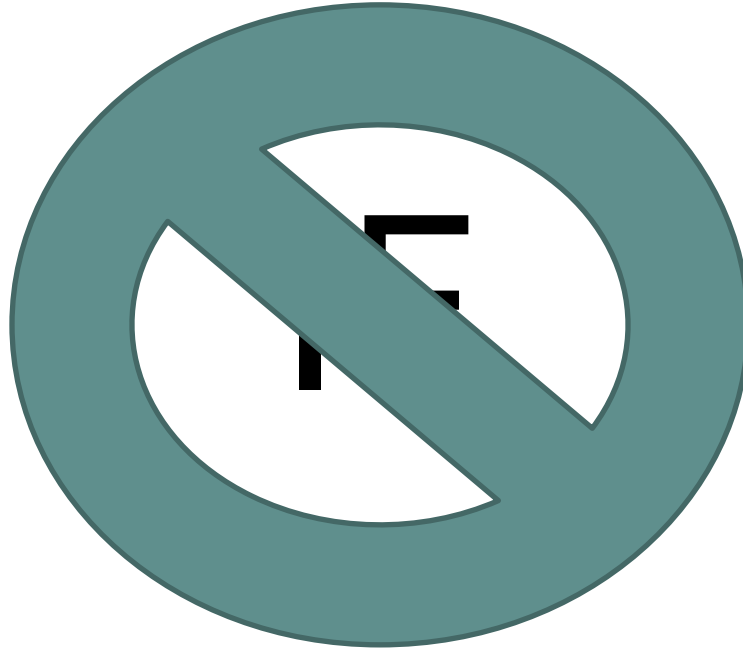
Fire Risk Pre-Plans



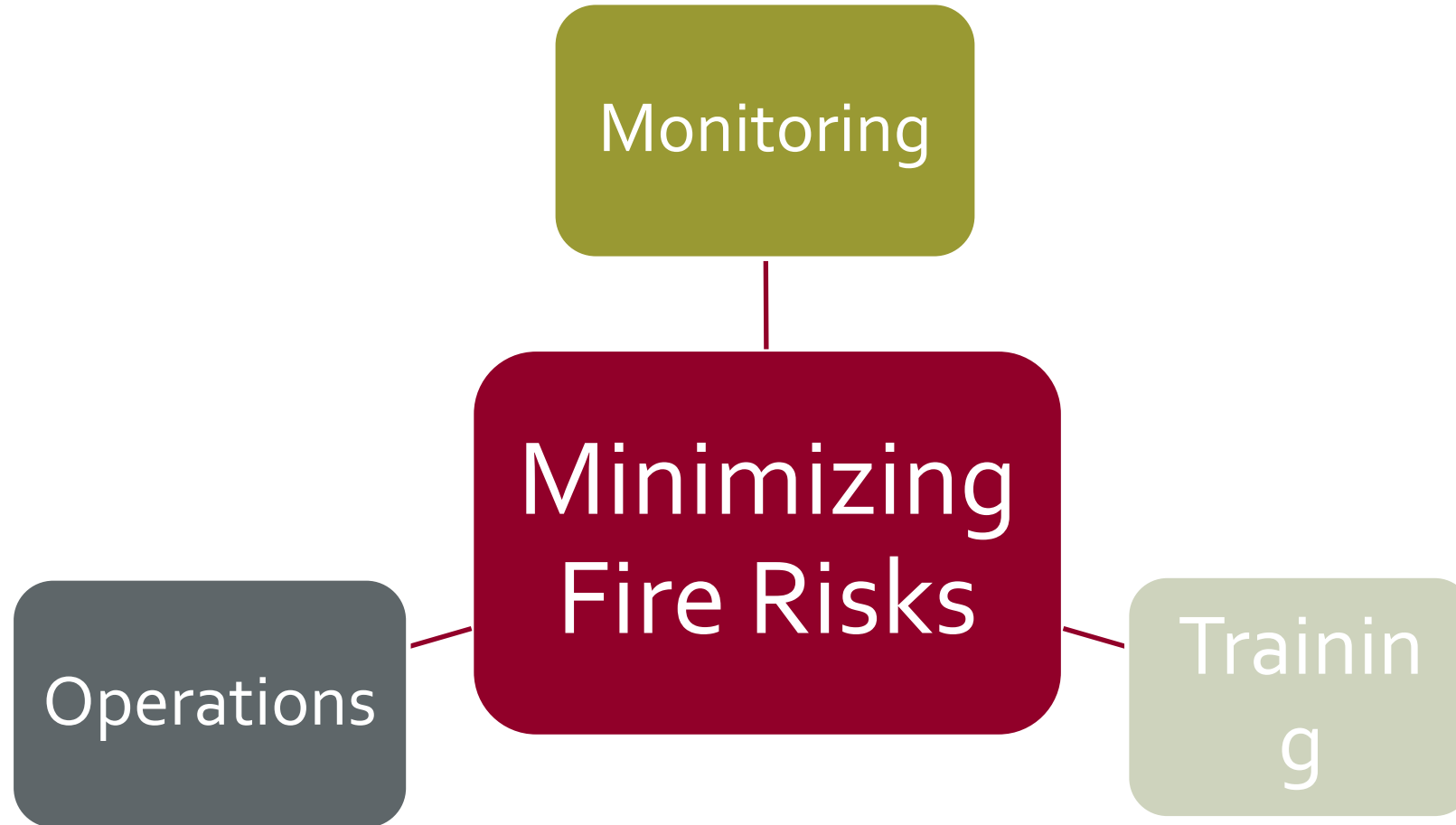
Fire Risk Pre-Plans



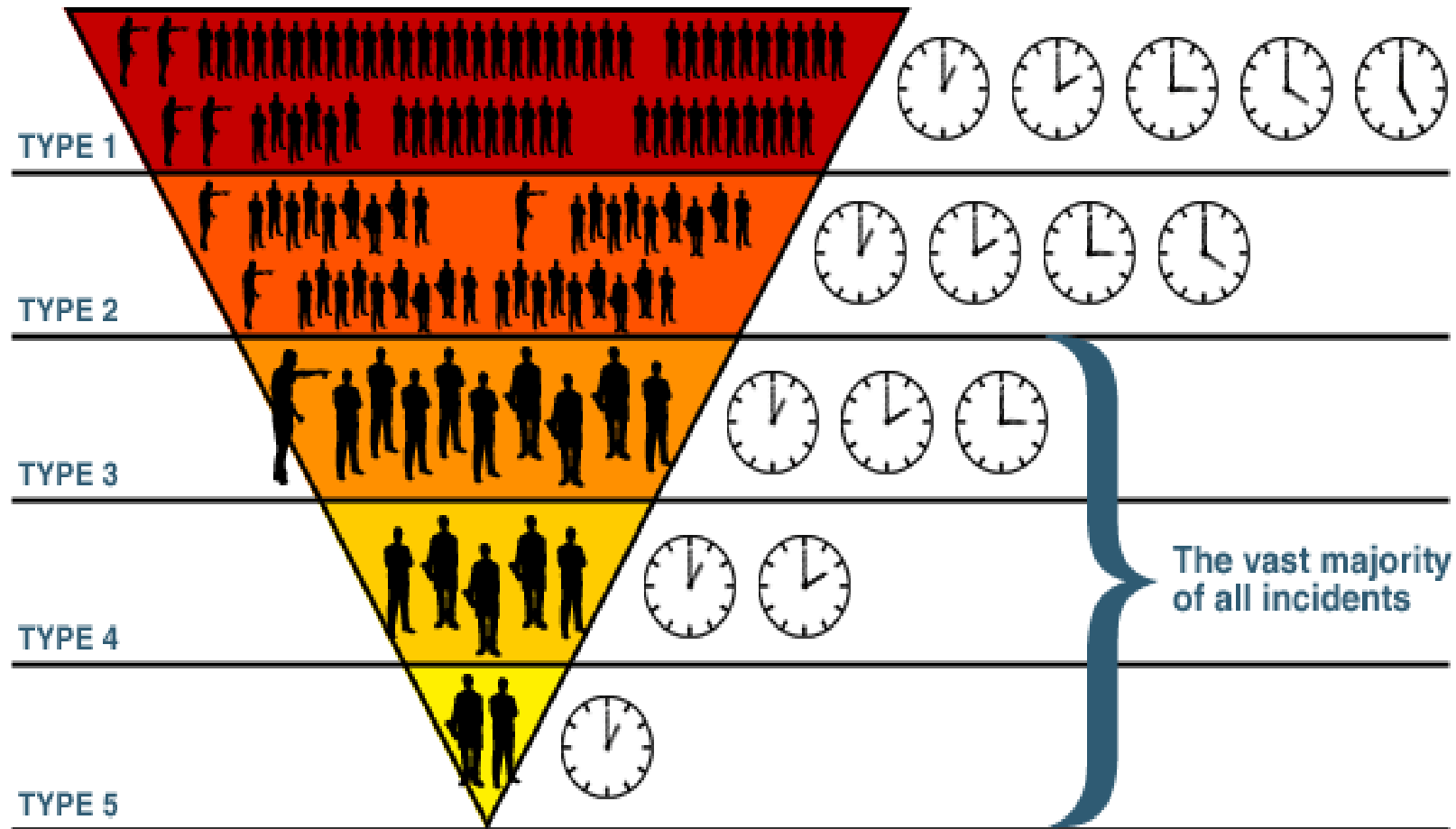
Fire Risk Pre-Plans



Fire Risk Pre-Plans



Fire Risk Pre-Plans



Fire Risk Pre-Plans



Fire Risk Pre-Plans

Fire Mitigation

Soil at working face

- Have a dedicated soil stockpile nearby
- How long does it take the site to excavate and place soil?
- How long to cover the entire working face?

Designated area for hot loads

Automated fire monitoring and suppression systems

Foams and suppressants

Avoid water if at all possible

- Particulate management
- Lower temps/protect equipment and personnel

Fire Risk Pre-Plans

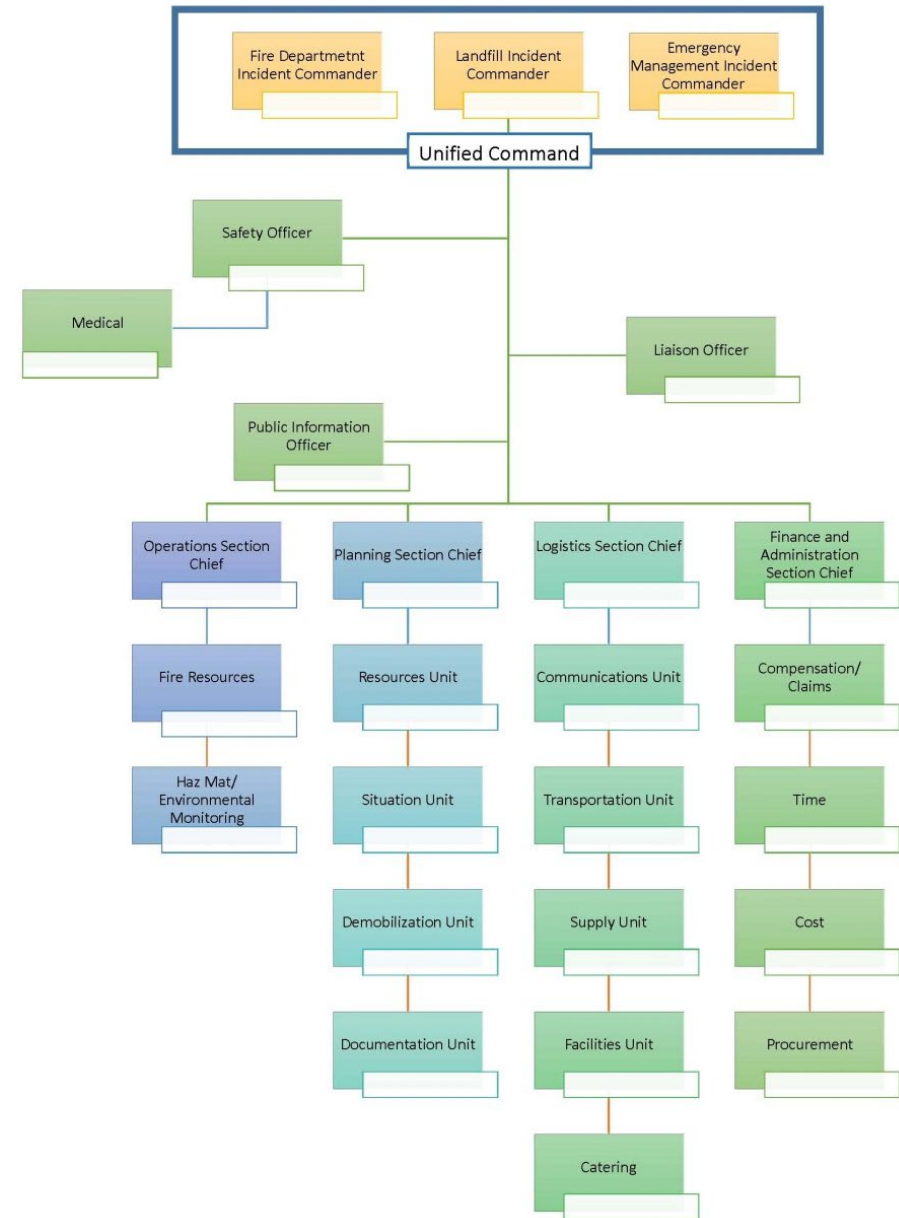
Plans:

- Opens dialogue
- Identifies resource and knowledge centers as well as gaps
- Selects contractors and vendors
- Provides emergency contacts
- Interoperability challenges (i.e., communication, connections, fuel cards, etc.)
- Assigns responsibilities (unified command structure)
- Develop a plan of action

Fire Risk Pre-Plans

Incident Command Structure

- Roles
- Responsibilities
- Authority
- Scalable to manage event
- Trainable



Fire Risk Pre-Plans

What Fire Departments Typically Want to Know:

- Access to water source (hydrant)
- Access into and around the site (gates, roads, lanes, etc.)
- Who has on-site authority
- What is stored in each building
- Utility shutoffs

Fire Risk Pre-Plans

Training Events:

- Train against the plan
- Familiarize operators with emergency responders and vice versa
- Test equipment (i.e., hose connections, communications, potable bladder tanks, etc.)
- Inventory supplies

Fire Risk Pre-Plans

Unique Safety Risks:

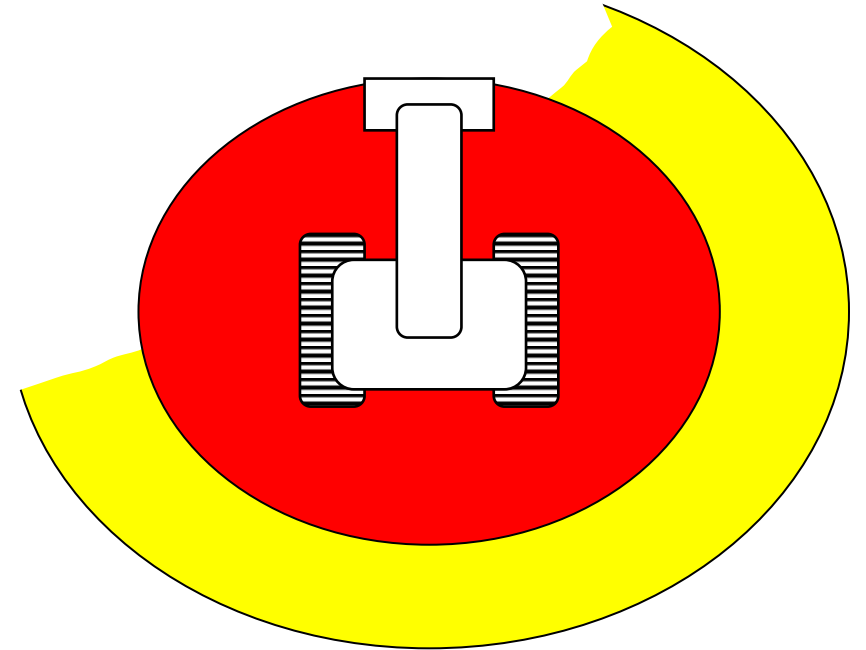
- Egos
- Toxic smoke
- Fire eruptions
- “Get-er Done” operator mentality
- Slippery liners
- Cave-ins
- PPE (emergency personnel as well as operators)
- Confined space
- Close interaction with heavy equipment

Fire Risk Pre-Plans

Unique Safety Risks:

Knowledge

Protect your emergency crews by informing them of unique risks. It can be as simple as bucket swing radius:



Fire Risk Pre-Plans

Unique Safety Risks: - What is Wrong Here?



Photo courtesy Todd Thalhammer

Fire Risk Pre-Plans

Wrap-Up:

- Fires happen... A LOT!
- Having a plan makes for a more effective response
- Plans identify resource and/or knowledge gaps that can be filled before an emergency occurs

Thank You

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