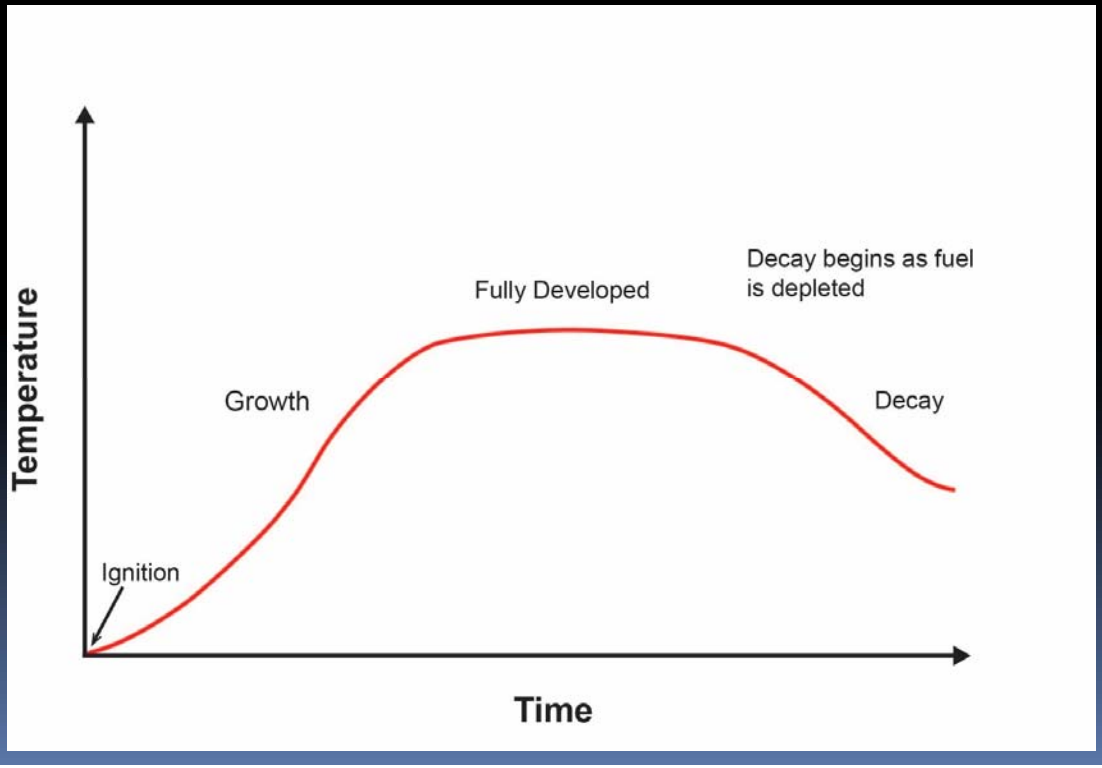
Fire Dynamics in a Structure

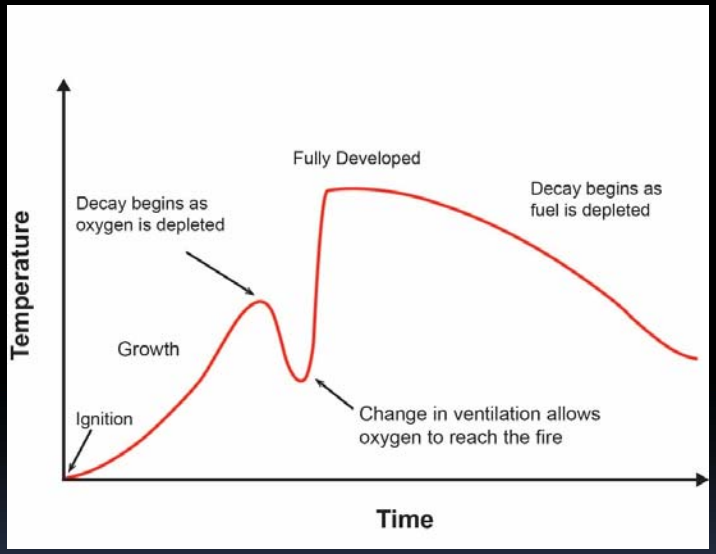
Ideal Fuel Controlled Model (the way fires used to grow)

They had plenty of fuel and plenty of air

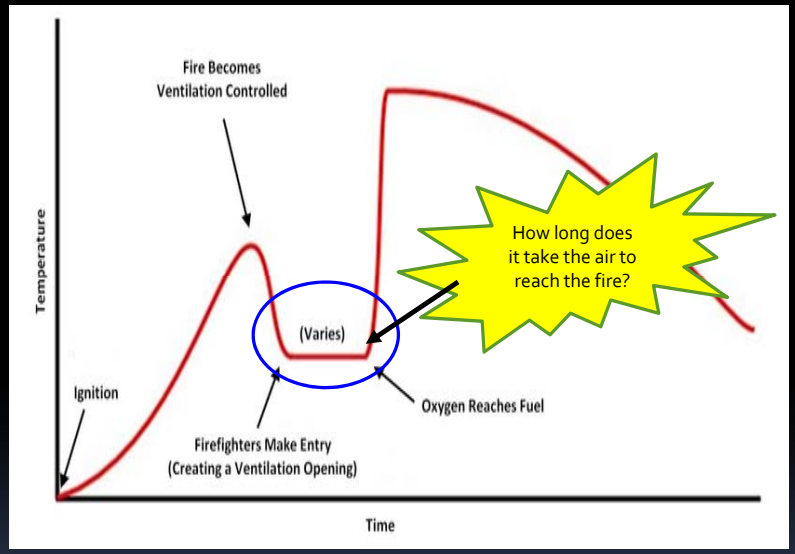


Fire Dynamics in a Structure

Vent Limited With Quick Flashover



Vent Limited With Delayed Flashover



The time it takes a ventilation limited fire to grow/flashover depends on a variety of factors… (NEXT SLIDE)

The time it takes a ventilation limited fire to grow/flashover depends on a variety of factors

- It will take time for the air/oxygen to physically reach the fire.
- The rate is governed by air movement, not what the fire inherently wants to do (take off fast as soon as it gets air).
- The rate of air movement is going to be impacted by:
  - the building
  - the external environment (especially the wind)
  - the location of the fire as compared to the ait entrance point
  - and the fire, and will be different each time.
- Air movement is the rate limiting step in this process.
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Other Factors…

- What is burning?
- What is still off-gassing
- How long did it take to get ventilation limited?
- What are the temps at the time of ventilation?

Tactical Options

- We can control two things:
  - Air to the fire
  - Water application (rate)

Tactical Options

- Quickly put water (hit it hard)_ on the fire before it can intensify - heat goes away.
- Control the door - delays the fire intensification - buys you time to get it.
- No ventilation at all, and the fire eventually snuffs itself out when the heat dissipates.
- Undisciplined truck company breaks the windows while the engine company is trying to advance – bad for everybody!