



Engineering Physics Lesson 2 — "Red Wing Simulation"

Doc 2 of 3 · Business

The question

Engineering asked *can it work?* Business asks *who pays for it?* — and a Startup Weekend gives you about 54 hours to answer.

Sources: OpenStax *Entrepreneurship* (Lavery & Littel, 2020) — Ch. 10 on the **lean plan** and Ch. 11 on the **Business Model Canvas** — and the U.S. SBA's *Plan your business* guide, which offers a **lean startup format** "if you want to explain or start your business quickly." All three sit in our new **Business** corpus.

The 80/20: four deliverables

Startup Weekend judges score **customer validation, execution, and business model**. The pitch carries all three. So the weekend reduces to four outputs:

#	Deliverable	Judges' score	Red Wing version
1	Proof someone wants it	Customer validation	Buyer map + three real messages
2	A working demo	Execution	Simulation + our HUD (see Doc 1)
3	A one-page business model	Business model	The canvas below
4	A five-minute pitch	All three	Ends with the partner ask

1. Proof someone wants it

- **Buyer map:** wildfire services, forestry, rural fire departments, agriculture (the pest-control variant: swap water for crop spray).

- **Three real messages:** a volunteer firefighter, a drone club, a farmer. "*No, we'd never use it*" is still data — OpenStax's warning is the founder who launches and finds "the target market isn't rushing to the website."
- **What the physics already told us (Doc 1):** a 10 L tank is under two seconds of one fire hose. The buyer isn't paying for a flying fire engine; they're paying to **find fires early** and knock down spot fires before they spread. Validate *that*.

2. A working demo

Simulation, not metal: PX4 + Gazebo with our own HUD composited on top — thermal view, hotspot lock, tank level. Generated video stays labelled "**concept render**."

3. The canvas (one page)

Block	Red Wing
Customer segments	Wildfire agencies, forestry companies, rural fire departments
Value proposition	Spot fires found in minutes, not hours; first strike before the crews arrive
Channels	Pilots with one agency → procurement through a hardware partner
Customer relationships	Pilot programme, then a service contract
Revenue streams	Software licence per drone · per-drone subscription · agency contracts via partner
Key activities	Thermal detection, tracking, autonomy software, the HUD
Key resources	The software stack, flight data from pilots
Key partners	Airframe + payload makers; NVIDIA (Jetson, Inception); a licensed US integrator
Cost structure	Engineering time, simulation, test hardware, insurance, certification

The decision that matters: software-first with hardware partners. It is a classic, believable model — and the physics backs it, because the heavy-lift body is exactly the part a two-person team shouldn't build.

4. The pitch — five minutes

Time	Beat
0:00– 0:30	Problem — wildfires start small and are found late
0:30– 2:00	Demo — hotspot lock → water jet → steam
2:00– 3:00	Who buys — the buyer map and what the three messages said
3:00– 4:00	Model — the canvas, software-first
4:00– 4:30	The ask — "We built the brain. We need a partner for the body and the regulated parts."

Stress test

- **Judge panel sim:** Muse plays three judges — a VC, a fire chief, a sceptical engineer — and grills the pitch.
- **Pre-empt the killer question:** *"Why wouldn't a big drone company just build this?"*
Answer it before anyone asks.
- **Either way it's a lab:** idea → canvas → demo → pitch is reusable for the next idea.