# Plan a project that finishes on time: the full report

Example: a furniture retailer in Lima, Peru, opening a second showroom in a new shopping center, with 22 weeks to the opening day. All six stages, from the guided tour.

## The playbook at a glance

1. What, exactly, is all the work?
   31 work packages in 5 branches, each with one owner, including 6 the first list missed
2. Which chain of work sets the finish date?
   A critical path of 19 weeks, 1 week inside the 20 you have: little room for anything to run late
3. How likely are you to finish by the date?
   About four in five (79%) of finishing by the date, with an expected finish of 18.3 of the 20 weeks
4. Is anyone booked on two things at once?
   Nobody is booked over 100% in any week; the busiest is **Visual merchandiser** at 90% in week 14
5. What could knock the plan off course?
   5 risks, each owned and treated, reviewed every 2 weeks; the biggest scores 12
6. How do you keep the plan on track, in plain view?
   At week 10, 2 weeks of buffer left of 3, 44% of the work done

STAGE 1 OF 6

# What, exactly, is all the work?

Stage 1 diagnosis

## 31 work packages in 5 branches, each with one owner, including 6 the first list missed

The breakdown: **31 work packages in 5 branches, with 9 owners.**

What the first list missed: **6 packages added after the check, half of them under Fitted showroom. Missing work never shows up as an error; it shows up as a late finish.**

Who owns what: **Buyer owns the most, 6 packages, as does Operations manager. Stage 4 checks whether that is more than one person can carry in the busy weeks.**

### What this may mean

Every branch is defined, covered by its packages and owned. That is the list of everything the schedule has to fit in.

### Investigate next

In stage 2, put the work in order: turn the packages into activities, say what each waits for, and find the chain that sets the finish date.

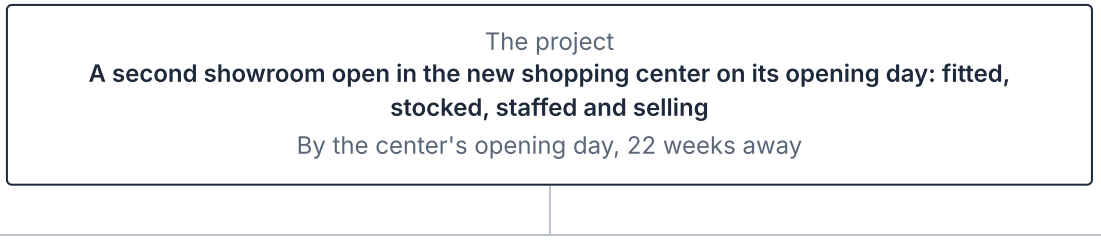
The three rules: the pieces under any item add up to all of its scope (the 100% rule); each item names something the project produces, not an action; and the breakdown stops at work packages small enough to estimate, give to one owner and track.

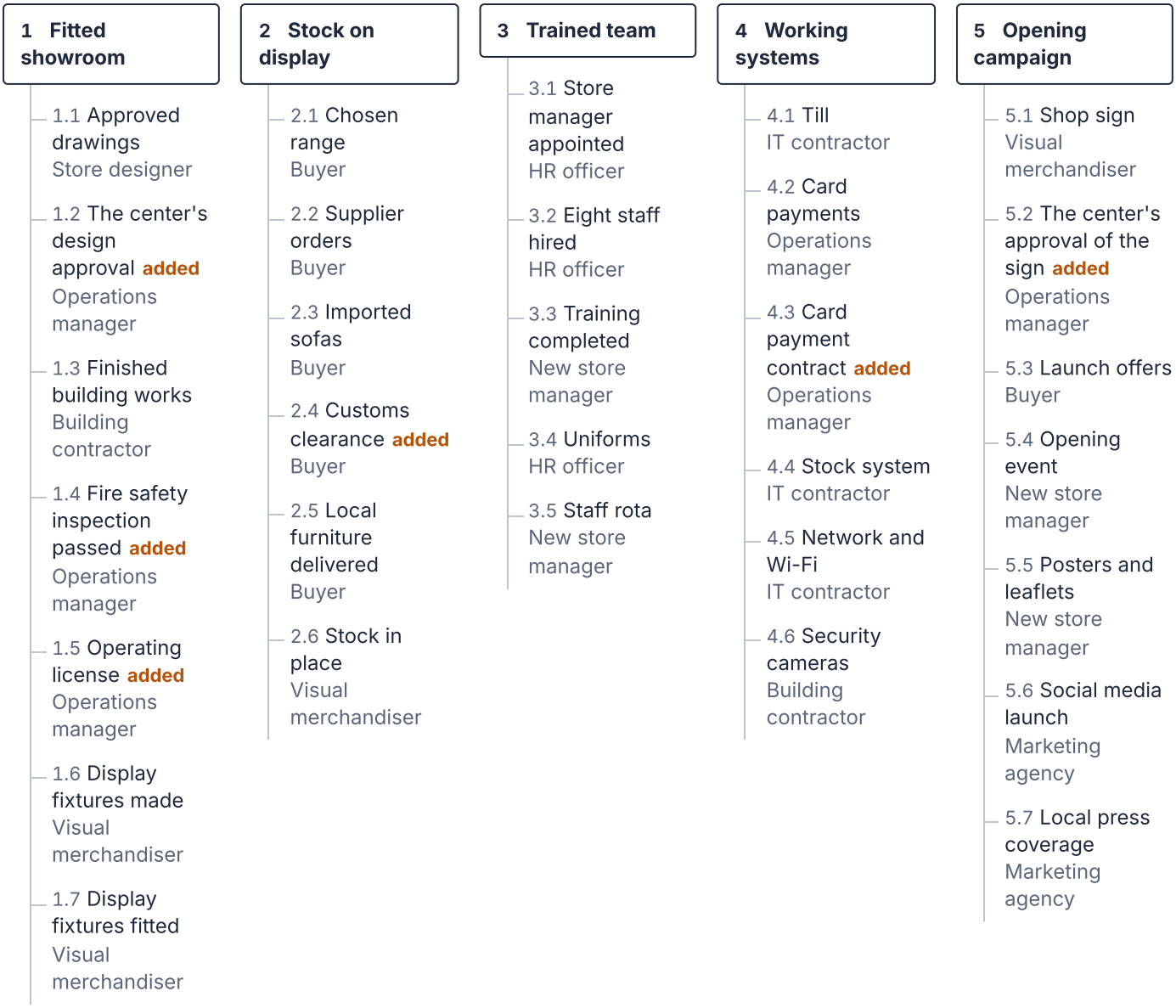
Keep this list: it is the test of whether the project is finished, and the starting point for the next similar project.

## The work breakdown structure

BROKEN DOWN

31 work packages in 5 branches, 9 owners





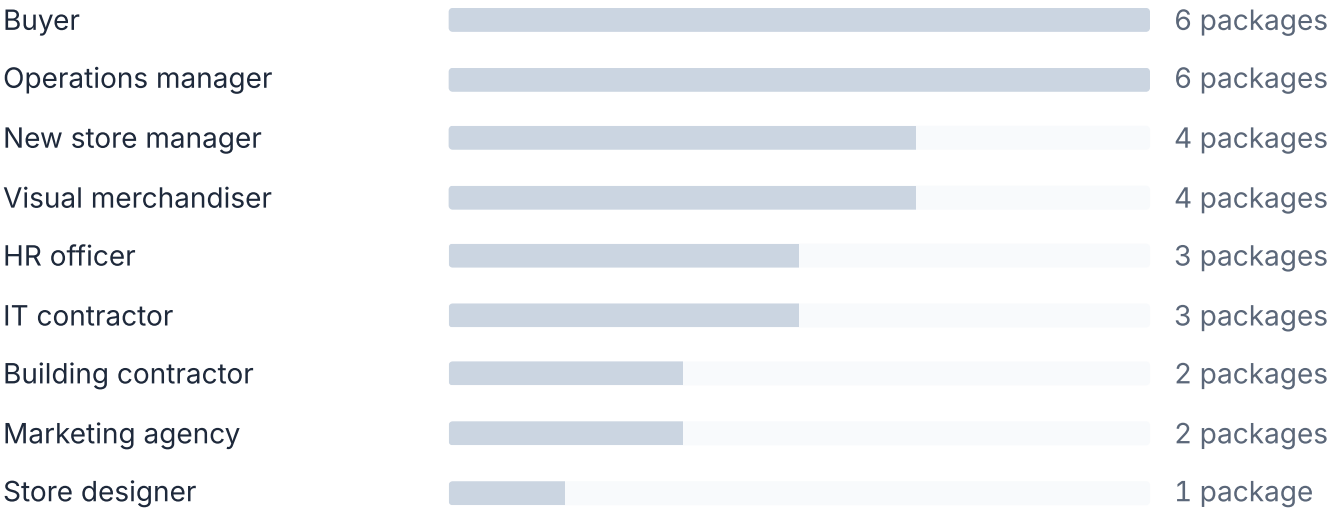

Numbered level by level: 1 is a branch, 1.1 a work package under it. Packages marked "added" came in after the check.

## What the first list missed

| BRANCH (LEVEL 1) | WORK PACKAGES | OWNERS | ADDED AFTER THE CHECK |
|---|---|---|---|
| **Fitted showroom** | 7 | 4 | The center's design approval; Fire safety inspection passed; Operating license |
| **Stock on display** | 6 | 2 | Customs clearance |
| **Trained team** | 5 | 2 | Nothing |
| **Working systems** | 6 | 3 | Card payment contract |
| **Opening campaign** | 7 | 5 | The center's approval of the sign |
| **All branches** | **31** | **9** | **6 packages** |

The highlighted row held the most of what the first list missed.

## Who owns what




Stage 4 checks whether the busiest owners can carry this alongside their other work.

## The three rules, checked

| | |
|---|---|
| ✓ **The 100% rule** | All 5 branches cover all of their scope. |
| ✓ **What "done" means** | Written for every branch. |
| ✓ **Nouns, not verbs** | Every package names what it produces. |
| ✓ **One owner each** | Every package has one owner. |

DECISION POINT

### Take the 31 work packages to stage 2

Every branch is defined, covered and owned. Next, put the work in order, with what each piece waits for, and find the chain that sets the finish date.

STAGE 2 OF 6

# Which chain of work sets the finish date?

Stage 2 diagnosis

## A critical path of 19 weeks, 1 week inside the 20 you have: little room for anything to run late

The critical path: **Store design drawn**, **The center's design approval**, **Building works**, **Fire inspection and license**, **Display fixtures fitted** and **Stock delivered and displayed**: 19 weeks, the shortest the project can be.

Against the time you have: **1 week inside the 20 you have.**

Close behind: **Staff trained in the showroom** and **Till, stock system and network installed** have only 1 week of float: a small slip there moves the finish.

The most float: **Card payment contract signed**, 15 weeks: it can start later, or take longer, without moving the finish.

Stage 1's work packages: **All 31 are in an activity, so nothing from stage 1 is left out of the schedule.**

### What this may mean

The plan fits, with little to spare. But one duration per activity is a guess that looks like a fact: a small overrun anywhere on the critical path takes the date with it.

### Investigate next

In stage 3, give the critical and near-critical activities three estimates each (optimistic, most likely, pessimistic), to find the odds of finishing by the date.

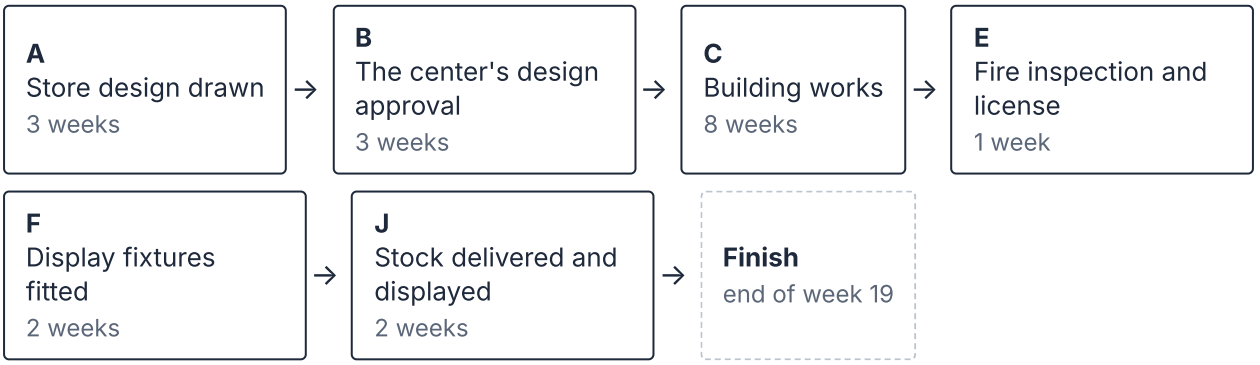
The forward pass gives each activity's earliest start: the latest finish among what it waits for. The backward pass gives its latest start without moving the finish. The gap between the two is its float, also called slack; the critical path is the chain with zero float.

These dates use one duration per activity, the most likely. Keep the network: stage 6's chart shows it as bars, and it is recalculated every time a date moves.

# The critical path

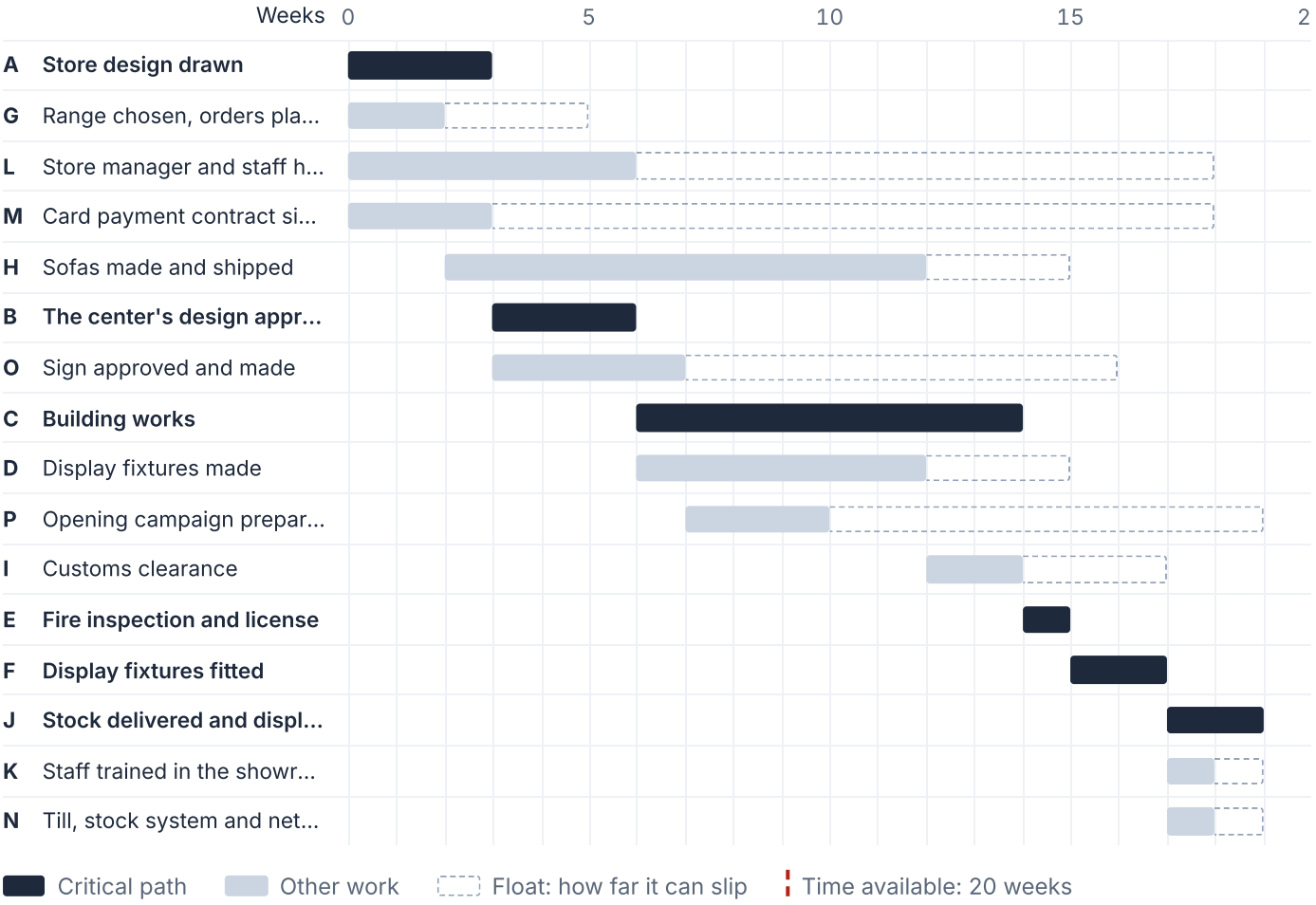
WORKED OUT

16 activities, 19 weeks from start to finish




**19 weeks, 1 week inside the 20 you have.**

# The schedule, at the earliest dates



## Each activity, worked out

| ACTIVITY | WEEKS | WAITS FOR | CAN START IN WEEK | FLOAT, WEEKS |
|---|---|---|---|---|
| **A. Store design drawn** | 3 | – | 1 | 0 |
| **B. The center's design approval** | 3 | A | 4 | 0 |
| **C. Building works** | 8 | B | 7 | 0 |
| **D. Display fixtures made** | 6 | B | 7 | 3 |
| **E. Fire inspection and license** | 1 | C | 15 | 0 |
| **F. Display fixtures fitted** | 2 | D, E | 16 | 0 |
| **G. Range chosen, orders placed** | 2 | – | 1 | 3 |
| **H. Sofas made and shipped** | 10 | G | 3 | 3 |
| **I. Customs clearance** | 2 | H | 13 | 3 |
| **J. Stock delivered and displayed** | 2 | F, I | 18 | 0 |
| **K. Staff trained in the showroom** | 1 | F, L | 18 | 1 |
| **L. Store manager and staff hired** | 6 | – | 1 | 12 |
| **M. Card payment contract signed** | 3 | – | 1 | 15 |
| **N. Till, stock system and network installed** | 1 | F, M | 18 | 1 |
| **O. Sign approved and made** | 4 | A | 4 | 9 |
| **P. Opening campaign prepared** | 3 | O | 8 | 9 |

Highlighted rows have zero float: they are the critical path.

## Stage 1's work packages

All 31 work packages are in an activity.

DECISION POINT

### It fits, just: check the odds in stage 3

The path is 19 weeks of the 20 you have. One duration per activity is a guess: find out how likely the date is before promising it.

STAGE 3 OF 6

# How likely are you to finish by the date?

Stage 3 diagnosis

## About four in five (79%) of finishing by the date, with an expected finish of 18.3 of the 20 weeks

The expected finish: **18.3 weeks, give or take 1.2, against the 20 you have. On most-likely durations alone the plan finishes in 17.**

The odds of making the date: **About four in five chances (79%). The critical path alone has 91%; the path through Range chosen, orders placed, Sofas made and shipped and Customs clearance, expected at 17.8 and less certain, pulls the odds down.**

The least certain: **Sofas made and shipped, 1.7 weeks either way, the widest range of any activity, then The center's design approval.**

Buying time: **Before changing Building works: 20.5 weeks expected, 31%. Now 18.3, 79%. It cost PEN 38,000; finishing 2.2 weeks late would cost about PEN 45,570.**

The buffer: **The plan's dates finish 3 weeks before the date. PERT expects about 1.3 of them to be used: hold them as one shared buffer in stage 5, not as padding on each activity.**

### What this may mean

The odds are ones you can accept. The gap between the plan's most-likely finish and the date is the buffer, and PERT says roughly how much of it to expect to use.

### Investigate next

In stage 4, check that nobody is booked on two things at once in the busy weeks, including work outside the project.

Expected duration (PERT): (O + 4M + P) ÷ 6. Standard deviation: (P − O) ÷ 6. Along a path, expected durations add, and so do the squares of the standard deviations; the odds come from the normal distribution.

When two paths could each finish last, both must finish on time, so their odds are multiplied. Paths that mostly share their uncertain activities with one already counted rise and fall with it, so they are left out.

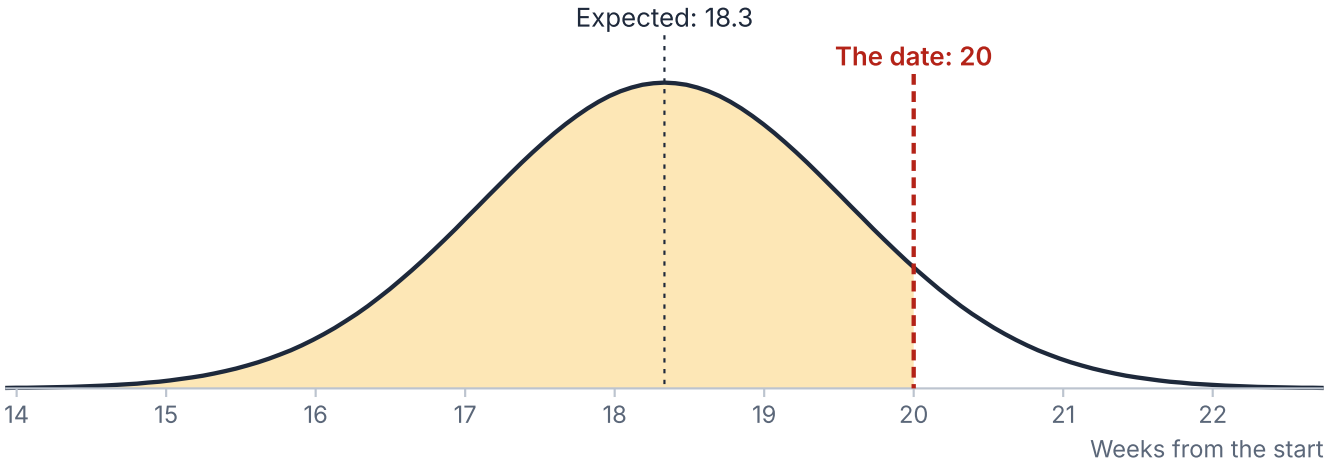
# The odds of making the date

ESTIMATED

12 activities with three estimates, 4 with one

| **79%** | **18.3** | **17** |
|---|---|---|
| odds of finishing by the date: about four in five | weeks expected, ± 1.2, of 20 | weeks on most-likely durations, leaving 3 to spare |

Before your changes: 20.5 weeks expected, 31%. C from 7, 8, 12 to 5, 6, 9. Bought 2.2 weeks of expected finish. Finishing that much later would cost about PEN 45,570; the change cost PEN 38,000.




By the date: 91% on the critical path alone  With the other path that counts: **79%**

# The paths that count

| PATH | EXPECTED, WEEKS | SPREAD | ODDS BY THE DATE | COUNTED |
|---|---|---|---|---|
| A → B → C → E → F → J | 18.3 | ± 1.2 | 91% | Yes |
| G → H → I → J | 17.8 | ± 1.9 | 87% | Yes |
| A → B → C → E → F → K | 17.5 | ± 1.2 | 98% | Shares its uncertainty with one counted |
| A → B → C → E → F → N | 17.5 | ± 1.2 | 98% | Shares its uncertainty with one counted |
| A → B → D → F → J | 16.8 | ± 1.1 | 99% | Shares its uncertainty with one counted |
| A → B → D → F → K | 16 | ± 1.1 | 99% | Almost sure to finish in time |
| **All the paths that count** | | | **79%** | |

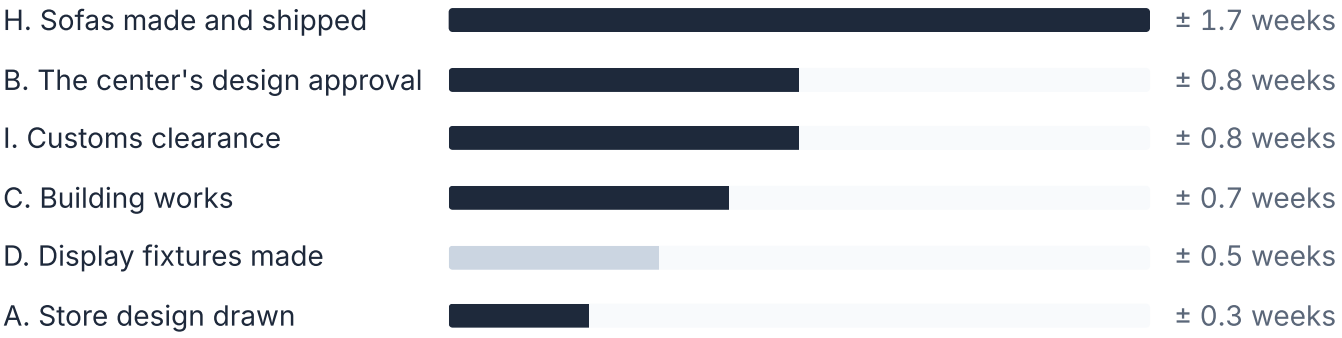
The highlighted path is the critical path on expected durations. Two paths that could each finish last must both finish on time, so their odds are multiplied.

## The critical path, re-estimated

| ACTIVITY | OPTIMISTIC | MOST LIKELY | PESSIMISTIC | EXPECTED |
|---|---|---|---|---|
| **A. Store design drawn** | 2 | 3 | 4 | 3.0 |
| **B. The center's design approval** | 2 | 3 | 7 | 3.5 |
| **C. Building works** | 5 | 6 | 9 | 6.3 |
| **E. Fire inspection and license** | 1 | 1 | 3 | 1.3 |
| **F. Display fixtures fitted** | 2 | 2 | 3 | 2.2 |
| **J. Stock delivered and displayed** | 1 | 2 | 3 | 2.0 |
| **The critical path** | | **17** | | **18.3** |

Highlighted rows were changed to buy time.

## The least certain activities




The spread is (pessimistic − optimistic) ÷ 6. Darker bars are on the paths that count: their ranges move the odds most.

## The buffer

The plan finishes
**17 weeks**
on most-likely durations

The date
**20 weeks**

The buffer
**3 weeks**
held in one place, before the date

Expected use
**1.3 weeks**
PERT's expected finish minus the plan's

Keep the spare time as one shared buffer held by one person (stage 5), not as padding on each activity, where it gets used up.

DECISION POINT

### Take the plan to stage 4

79%, about four in five, meets the 75% you can accept. Keep the 3 weeks before the date as one shared buffer. Next, check that nobody is booked on two things at once.

STAGE 4 OF 6

# Is anyone booked on two things at once?

Stage 4 diagnosis

## Nobody is booked over 100% in any week; the busiest is **Visual merchandiser** at 90% in week 14

**Before you rely on this**

- **Visual merchandiser**, **Buyer** and **New store manager** peak above 80%. Plan people at about 80%: the rest absorbs illness, meetings and everything else.

The busiest week: **Week 14: Visual merchandiser at 90% of their time, counting the project and everything else.**

Clashes settled: **Visual merchandiser from 150% to 90%; Operations manager from 110% to 80%. No date on the critical path changed.**

Who decides: **Someone is named to decide between competing claims, before the next clash.**

### What this may mean

Everyone can carry their share of the busy weeks, and someone is named to decide when claims compete.

### Investigate next

In stage 5, list what could knock the plan off course, give each risk an owner, and hold the spare time as one shared buffer.

Each cell is a share of one person's time: the project's activities at their scheduled weeks, and the work outside the project in the weeks it runs. Read across a row for one person's load.

Check the busiest weeks, not the average: a person at 60% on average can still be at 150% in the week everything lands.

# Each person's load, week by week

CHECKED

5 people over 20 weeks, 4 activities with people on them

| Person | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | Peak |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Visual merchandiser | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 80 | 80 | 80 | 80 | 90 | 90 | 90 | 90 | 20 | 20 | 20 | 90% |
| Operations manager | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 30 | 30 | 30 | 30 | 80 | 80 | 80 | 80 | 20 | 20 | 20 | 80% |
| Buyer | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 70 | 70 | 70 | 90 | 60 | 40 | 60 | 60 | 40 | 40 | 40 | 90% |
| HR officer | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 80 | 50 | 50 | 50 | 50 | 80% |
| New store manager | | | | | | | | | | | | | | | | 90 | | | | | 90% |

Over 100%: a clash  Over 80%: no room for anything else

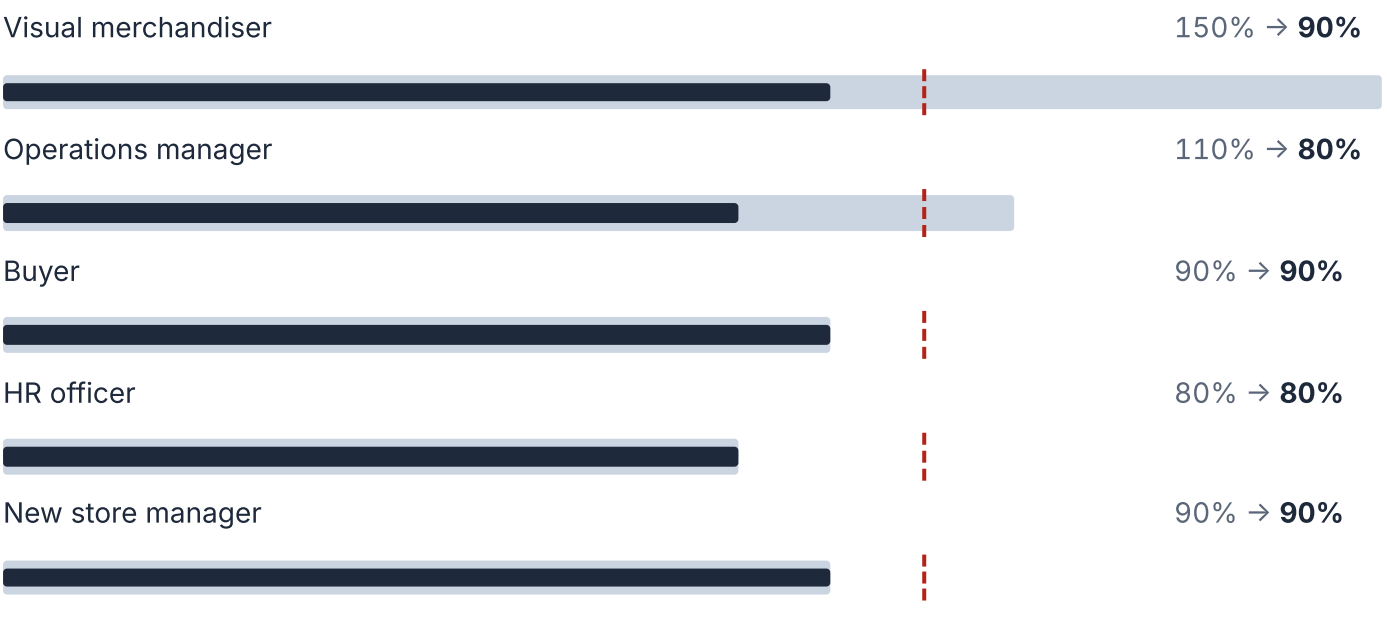
Weeks counted from the start; the busiest week is outlined.

# The busiest week: week 14

| PERSON | THIS PROJECT | DAY-TO-DAY WORK | TOTAL |
|---|---|---|---|
| **Visual merchandiser** | 70% | 20% | 90% |
| **Operations manager** | 60% | 20% | 80% |
| **Buyer** | 20% | 40% | 60% |
| **HR officer** | 0% | 50% | 50% |
| **New store manager** | 0% | 0% | 0% |

Each cell is a share of that person's week. The outlined total is the week's worst; any total over 100% is a promise nobody can keep.

# Before and after



DECISION POINT

## Take the plan to stage 5

Nobody is over 100% in any week, and the owner decides between competing claims. Visual merchandiser, Buyer, New store manager still peak above 80%: watch them.

STAGE 5 OF 6

# What could knock the plan off course?

Stage 5 diagnosis

## 5 risks, each owned and treated, reviewed every 2 weeks; the biggest scores 12

**Before you rely on this**

- **Building works slip** is transferred, but on the critical path. A contract or insurance moves the cost; the delay still happens, so keep it in the buffer's sights.

The biggest risk: **Paperwork errors hold the sofas at the port**, scoring 12 of 25: reduce it, owned by **Buyer**.

The register: **5 risks, none scoring 15 or more, 2 on the critical path. Every one has an owner, 4 people in all.**

The buffer: **3 weeks before the date, held by one person. PERT expects about 1.3 of it to be used.**

Reviews: **Every 2 weeks, with 3 early signs to watch for on the way.**

### What this may mean

Each risk has someone watching it and a planned response, the spare time sits in one place, and the register has a rhythm. That is what makes it managed rather than listed.

### Investigate next

In stage 6, put the plan on a Gantt chart everyone can read, and update it every week with the work actually finished.

The score is probability × impact, each 1 to 5. Treatments: avoid (don't do the thing that carries the risk), reduce (lower the probability, the impact, or both), transfer (move the cost by contract or insurance; the delay still happens), accept (carry it on purpose, and watch it).

Write each risk as a cause, an event and a consequence, so someone outside the room would recognize it.

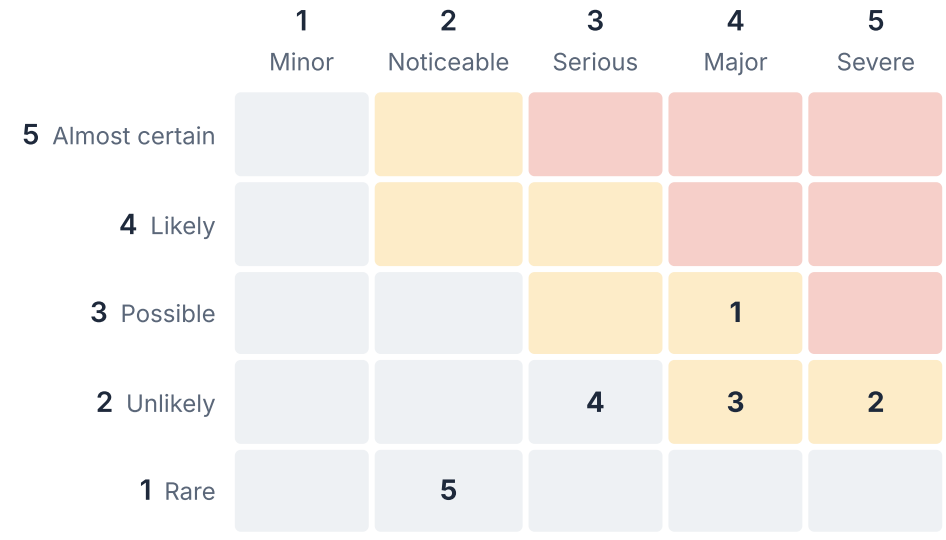
# The register, biggest first

CHECKED

5 risks, 2 on the critical path

| RISK | SCORE | TREATMENT AND ACTION | OWNER | EARLY SIGN |
|---|---|---|---|---|
| **1** A new customs broker; paperwork errors hold the sofas at the port; the showroom opens half empty<br>I. Customs clearance | **12** 3 × 4 | **Reduce**: The broker checks the papers before the ship sails | Buyer | The supplier's production photos, week 6 |
| **2** Drawings use the old fire code; the inspection fails; weeks of rework on the critical path<br>On the critical path: E. Fire inspection and license | **10** 2 × 5 | **Reduce**: A fire engineer inspects first, in week 11 | Operations manager | The fire engineer's report, week 11 |
| **3** The builder moves the crew to another site; building works slip; the critical path, and the opening, move<br>On the critical path: C. Building works | **8** 2 × 4 | **Transfer**: A late-finish penalty in the contract | Operations manager | Fewer people on site than agreed, week 8 |
| **4** New staff find other jobs; they leave before opening; too few people for the opening weeks<br>L. Store manager and staff hired | **6** 2 × 3 | **Reduce**: Hire one more than needed | HR officer | – |
| **5** The printer is late; the posters arrive after the opening; a week without posters<br>P. Opening campaign prepared | **2** 1 × 2 | **Accept** | New store manager | – |

# Probability and impact




Up: probability  Across: impact

15 or more  8 to 14  Under 8  Each number is the risk's place in the register, biggest first.

## The buffer, the early signs and the reviews

| | |
|---|---|
| **3 weeks of buffer** | at the end of the plan, held by the operations manager. PERT expects about 1.3 weeks to be used. Time comes out of it only when they say so, for whichever risk comes true. |

| | |
|---|---|
| **Week 2** | Review the register, with the operations manager |
| **Week 4** | Review the register, with the operations manager |
| **Week 6** | **Early sign:** The supplier's production photos (Paperwork errors hold the sofas at the port; Buyer) |
| **Week 6** | Review the register, with the operations manager |
| **Week 8** | **Early sign:** Fewer people on site than agreed (Building works slip; Operations manager) |
| **Week 8** | Review the register, with the operations manager |
| **Week 10** | Review the register, with the operations manager |
| **Week 11** | **Early sign:** The fire engineer's report (The inspection fails; Operations manager) |
| **Week 12** | Review the register, with the operations manager |
| **Week 14** | Review the register, with the operations manager |
| **Week 16** | Review the register, with the operations manager |
| **Week 18** | Review the register, with the operations manager |
| **Week 20** | Review the register, with the operations manager |

DECISION POINT

### Take the plan to stage 6

Every risk has an owner and a treatment, the operations manager holds the buffer, and the register is reviewed every 2 weeks. Building works slip is transferred but on the critical path: the delay still happens.

STAGE 6 OF 6

# How do you keep the plan on track, in plain view?

Stage 6 diagnosis

## At week 10, 2 weeks of buffer left of 3, 44% of the work done

**Before you rely on this**

- 2 early signs from the risk register are due by now. Ask each risk's owner what they saw.

The finish: **Forecast for the end of week 18, 1 week later than planned; the date is the end of week 20.**

The buffer: **2 weeks left of 3 weeks (33% used).**

The work done: **44% of the work by duration: 7 activities finished, 3 under way, counting finished work packages, not estimates of progress.**

The critical path now: **It has changed: Sofas made and shipped, Customs clearance** and **Stock delivered and displayed.**

The biggest slips: **Sofas made and shipped** 2 weeks; **Customs clearance** 2 weeks; **Stock delivered and displayed** 1 week.

### What this may mean

The chart shows the work as it stands this week: what's finished, what's late, the critical path now and the buffer left. That is what makes it worth looking at.

### Investigate next

Update the chart again next week with the work packages finished. Watch the buffer, not the percentages.

Finished work sits at its actual dates; work running late at its new expected finish; work not started after what it waits for, and not before this week. The critical path and the buffer are worked out again from there.

The buffer by week: week 2: 3; week 4: 3; week 6: 3; week 8: 3; week 10: 2.

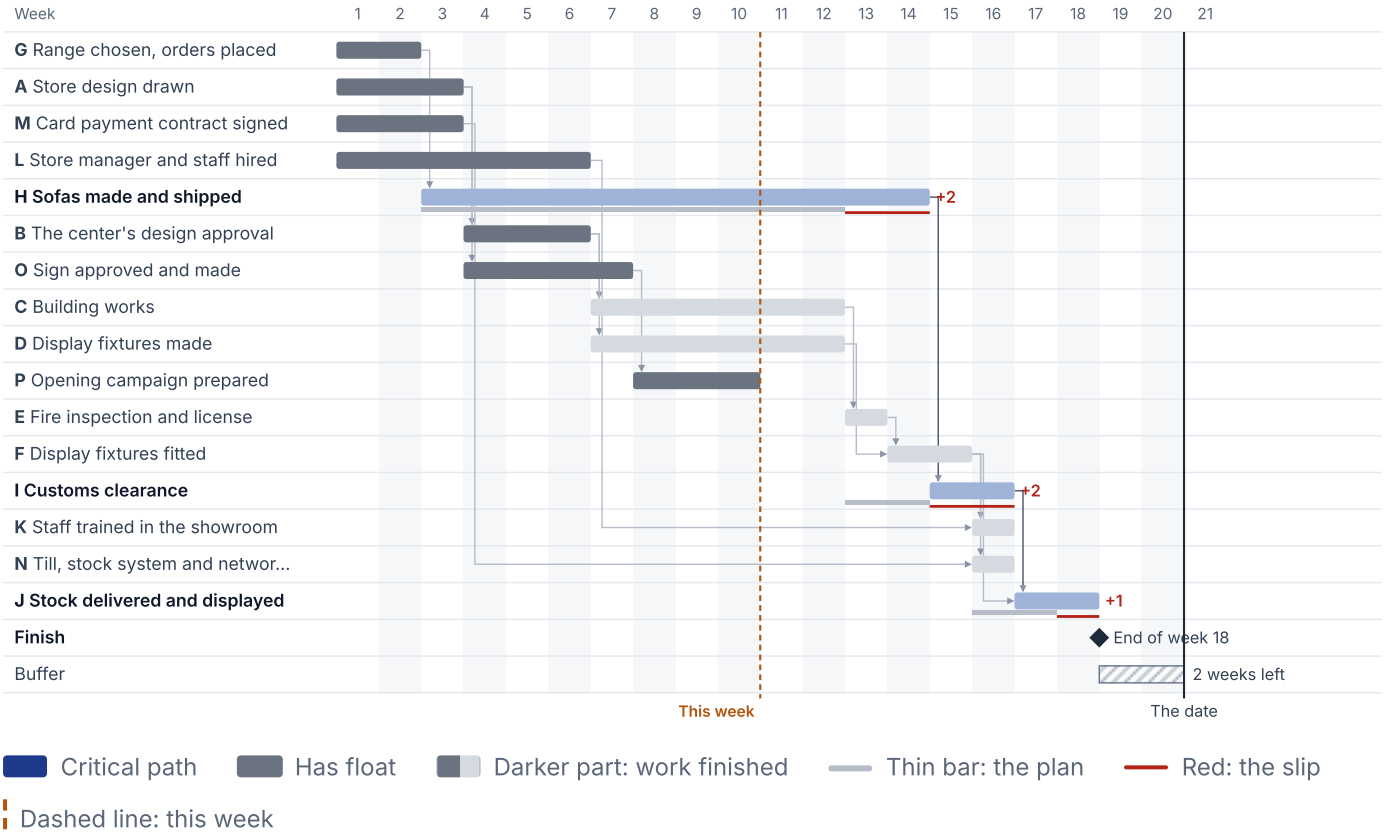
# The chart this week

AT THE END OF WEEK 10

16 activities, 7 finished, 3 under way

| | | |
|---|---|---|
| **18**<br>the week of the forecast finish; planned for 17 | **2**<br>weeks of buffer left of 3 | **44%**<br>of the work done: 7 of 16 finished |

Since week 8: the buffer went from 3 weeks to 2 weeks.




Critical path · Has float · Darker part: work finished · Thin bar: the plan · Red: the slip · Dashed line: this week

# The critical path now, and what has slipped

| ACTIVITY | PLANNED | NOW | SLIP | FLOAT NOW |
|---|---|---|---|---|
| **H Sofas made and shipped**<br>Critical path now, newly | weeks 3–12 | weeks 3–14 | 2 weeks | None |
| **I Customs clearance**<br>Critical path now, newly | weeks 13–14 | weeks 15–16 | 2 weeks | None |
| **J Stock delivered and displayed**<br>Critical path now | weeks 16–17 | weeks 17–18 | 1 week | None |

## The buffer, update by update




Buffer left, in weeks, at each update. Across: the week of the update.

DECISION POINT

### On track: update it again next week

2 weeks of buffer left of 3 weeks, 44% of the work done, counted by finished work packages. The critical path now runs through H, I, J: watch those first.

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Made with the free Project Planning Tool at whichframework.org/tools/project-planning-tool.html: all six stages of the "Plan a project that finishes on time" playbook. Figures are from your data; the diagnosis describes what such patterns often point to, not proven causes.