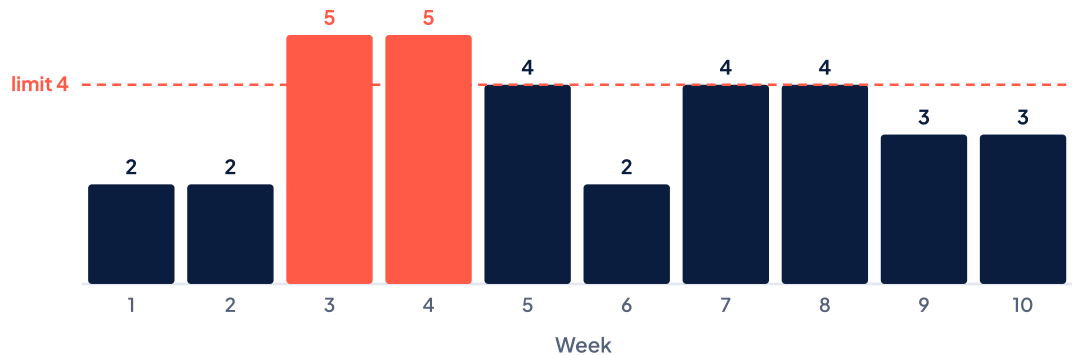


Resource histogram and levelling

Set the people the plan needs per period against those available, and remove the overloads.



Illustrative early-start plan, people per week; 4 are available. Levelled to 4 (least float first), it takes 11 weeks; still 34 person-weeks.

WHAT IT IS

A resource histogram shows the demand for one resource per period against a line for what is available. Bars above the line are **overloads**. **Resource smoothing** holds the end date and shifts work only inside float; APM (Association for Project Management) also allows changing the people. **Resource levelling** keeps the limit and lets the date move.

HOW IT WORKS

- 01 Add the people of all activities running each week.
- 02 Draw the bars and the limit; mark the overloads.
- 03 Ask for people for the peak first; then smooth.
- 04 Still over? Level, least float first; recheck the path.

MID-LEVEL · WORKED EXAMPLE

Apply it well

The situation: A city team has ten weeks and four people before online parking permits go live. In weeks 3 and 4, three activities overlap and need five.

The project manager first asks for a fifth person for weeks 3 and 4. Smoothing cannot help: no move within float clears the peak. Levelled to four, go-live moves a week, so the steering group chooses: a person or a week.

In the exam: Name the overloaded weeks, give the **first move** (people for the peak), then smooth or level and give the date.

SENIOR · WORKED EXAMPLE

Design and lead it

The situation: A city is joining 14 online services under one login over 30 months. Six integration specialists serve all its projects; a portfolio meeting allocates them.

The meeting allocates three; the plan needs four in months 17–19: $(4 - 3) \times 3 = 3$ specialist-months. Buy them at about €16,000 each ($3 \times €16,000 = €48,000$), borrow one, or level. €48,000 exceeds the board's €40,000 per-decision limit, so it decides.

In the exam: Use it as **portfolio evidence**: demand against allocation, options with cost and effect, and who decides.

WHERE IT SITS

IPMA · ICB4

4.5.4.4: level the resources of a given plan (p. 114); 4.5.8.4: resource conflicts (p. 130)

PMI · PMBOK® GUIDE 8 · PMP® EXAM

Guide pp. 193–194: leveling may move the date, smoothing stays in float; histogram p. 138. Exam: Process task 4

APM · BOK 8 · PMQ EXAM

BoK (APM's Body of Knowledge) §5.6.3, glossary: levelling resource-limited; smoothing time-limited, may change resources. PMQ (APM's Project Management Qualification) 21d

Sources: IPMA ICB4 (2015); PMI, PMBOK® Guide, 8th ed.; PMI, PMP® Examination Content Outline (2026); APM Body of Knowledge, 8th ed.; APM, PMQ handbook (v6, 2026)

Key: IPMA = International Project Management Association; ICB4 = IPMA's Individual Competence Baseline (4.5.4 etc.: its competence elements); PMI = Project Management Institute; PMBOK® Guide = PMI's body-of-knowledge guide; PMP® = PMI's Project Management Professional. Unofficial study material for IPMA®, PMI® and APM exams. Not affiliated with, endorsed by or approved by IPMA, PMI or APM, and not an accredited or endorsed training provider. IPMA® and IPMA ICB® are registered trademarks of IPMA in Switzerland and other countries. PMI, PMP, CAPM and PMBOK are registered marks of Project Management Institute, Inc. APM is a trade mark of the Association for Project Management. Other marks belong to their owners. PMP® exam facts are from PMI's public PMP® Examination Content Outline (2026); check the current version on pmi.org. APM's qualifications are its own; this series is not an APM Accredited Provider or APM Endorsed. Examples use a fictional city and its projects. Levels (this series' labels): Mid-level = moderately complex projects (IPMA Level C, PMI's PMP®); Senior = complex projects and people (IPMA Level B, APM's Chartered Project Professional).

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