

Batch transfer versus one-piece flow

Construct the two transfer schedules, calculate first and final completion, and explain why lower elapsed lead time does not mean reduced person-work.



The packet waits for the other five

Fictional service simulation: six complete requests R1-R6 are ready at time zero. Three dedicated workers each perform a different two-minute step. Coordinator Anika compares moving the entire six-request batch after each step with transferring each request immediately when its step is done.

Your role and the reference condition

Service improvement facilitator and the three participating workers.

Normal: Every request receives all three steps in order; no worker performs two tasks simultaneously.

Gap: The batch rule delays downstream work even when the first request is ready.

Work within these conditions

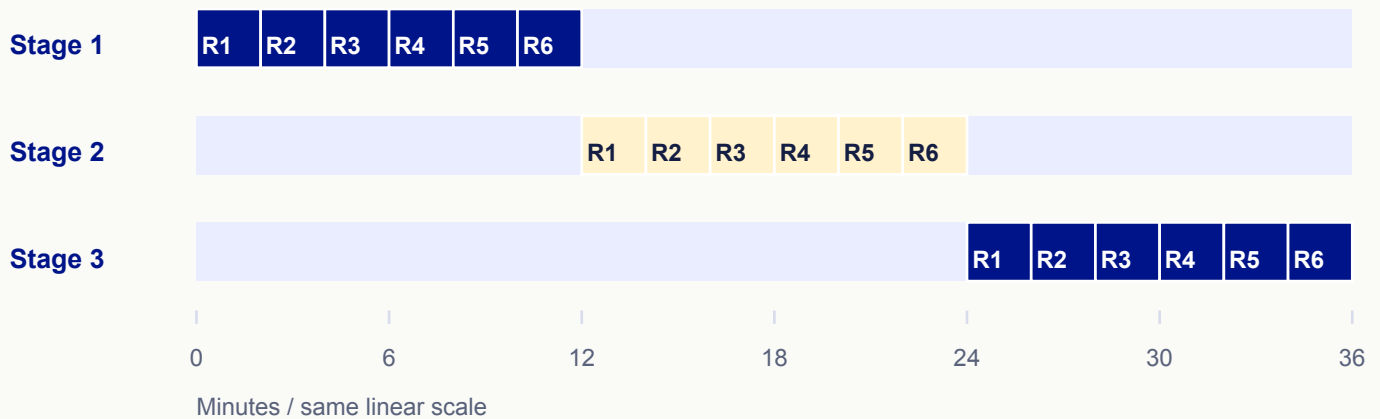
1. No setup, travel, variability or rework is included.
2. Each stage has its own worker; this is not a one-person staffing model.

Fictional teaching case. Supplied observations support the exercise; proposed actions are not verified customer results.

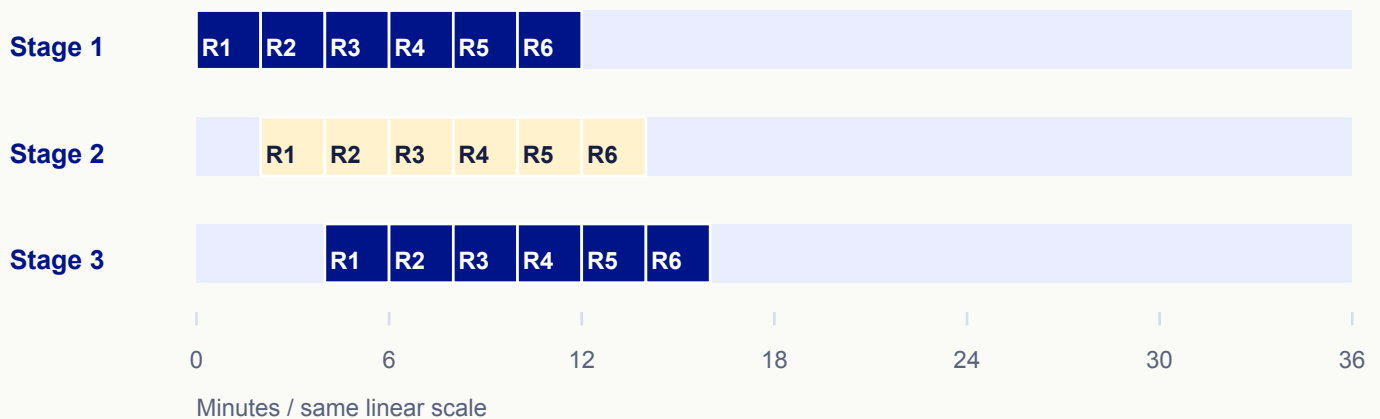
See how the method works

Keep the amount of work identical when comparing transfer policies. Six requests require three two-minute operations, performed by three dedicated workers. With transfer batches of six, the first request completes at minute 26 and the last at 36. With immediate transfer of each request, those times become 6 and 16. Both arrangements contain 36 person-minutes of work. The improvement comes from overlap between stages and less waiting for a batch to fill. Real processes also have travel, setups, variation and quality checks; include those before promising this theoretical result at work.

Transfer six - first 26 min; last 36 min



Transfer one - first 6 min; last 16 min



Same labor: 36 person-minutes in each case.

Three dedicated workers, one per stage; All requests available at time zero; Two minutes at each stage; No setup, travel, variation or rework.

Method exhibit: Transfer six, Transfer one, Same labor.

Follow the evidence and decisions

Inspect the supplied case inputs

Teaching input	Value
Requests ready at time zero	6
Dedicated stages / workers	3 / 3
Time per request at each stage	2 min
Batch transfer rule	Move all 6 together
One-piece transfer rule	Move each completed request immediately
Work required	$6 \times 3 \times 2 = 36$ person-min

01 / Build the first stage before comparing

Place R1 at minutes 0-2 through R6 at 10-12 on worker 1's lane. Use the same first-stage sequence for both alternatives.

Why: Holding the task times and staffing constant isolates the effect of the transfer rule. Otherwise the diagram would mix different causes.

Evidence / check: Worker 1 finishes the six requests at minute 12 in both schedules.

02 / Honor the whole-batch handoff

Worker 2 begins at minute 12 and finishes at 24. Worker 3 begins at 24, completes R1 at 26 and R6 at 36.

Why: R1 waits for its five companions at the first and second handoffs. The waiting is elapsed lead time, not additional processing work.

Evidence / check: Batch first completion 26 min; final completion 36 min.

03 / Overlap work on different requests

With immediate transfer, worker 2 processes R1 at 2-4 while worker 1 processes R2. Worker 3 processes R1 at 4-6; later requests follow every two minutes.

Why: The workers overlap across requests; no request skips precedence and no individual worker is double-booked.

Evidence / check: One-piece first completion 6 min; R6 leaves stage 3 at minute 16.

04 / Reconcile elapsed and labor quantities

Sum all 18 two-minute tasks in each schedule: 36 person-minutes. Compare the first and last completion separately instead of calling 20 saved elapsed minutes a labor saving.

Why: The model reduces waiting through overlap. It does not remove a task or prove fewer people are needed.

Evidence / check: First completion improves by 20 min and final completion by 20 min; person-work is unchanged.

05 / Plan the real-world test

Check transfer feasibility, information completeness, quality feedback and worker access before trying smaller batches. Record any extra transfer work or interruptions in the actual trial.

Why: The clean simulation omits conditions that may change the result. Small transfers are useful hypotheses, not permission to ignore safety or necessary processing batches.

Evidence / check: Trial compares completion distribution, rework and actual work content under a declared staffing arrangement.

Completed transfer comparison

Measure	Batch of 6	Transfer each request
Stage 1 occupied	0-12 min	0-12 min
R1 at stage 2	12-14 min	2-4 min
R1 complete	26 min	6 min
R6 complete	36 min	16 min
Person-work	36 person-min	36 person-min

The second stage cannot receive individual requests

A required approved process accepts only a validated processing batch. No alternative has yet been qualified.

Decision

Do not assume one-piece processing is feasible. Investigate smaller transfer batches before and after the required batch, subject to the real process constraints.

Reasoning

Processing batch and transfer batch are different decisions; the numerical one-piece result no longer describes this route unchanged.

What would change the decision?

Mark the required batch boundary and recalculate a feasible schedule before claiming a gain.

Practise with a changed case

Four requests with a longer step

Separate fictional simulation: four requests, three dedicated workers, each step takes three minutes. All requests are ready at zero and the same no-travel/no-variation assumptions apply.

Input	Value
Requests	4
Stages	3
Time per stage	3 min
Staffing	One dedicated worker per stage

Your task

1. Draw both the full-batch and immediate-transfer schedules.
2. Calculate first completion, last completion and person-work for each.
3. Explain why combining all work under one person invalidates the overlap calculation.

Use the next page to record your reasoning before reading the answer.

Your practice worksheet

Four requests with a longer step

Request/stage start and finish

First completion

Last completion

Person-minutes

Staffing and feasibility assumptions

Complete your reasoning before turning to the answer. Use the separate learner workbook for group practice.

Check your reasoning and transfer it

1. Batch stage intervals are 0-12, 12-24 and 24-36. First completion is minute 27 and last is 36.
2. Immediate transfer completes the first request at 9 minutes and the fourth at 18 minutes. There are 12 tasks of three minutes: 36 person-minutes in either schedule.
3. One person cannot perform the overlapping tasks shown on three worker lanes. A different staffing arrangement needs its own feasible schedule.

Suggested completed record

Alternative	Completion times, min	Work / decision
Full batch	First 27; last 36	36 person-min
Immediate transfer	First 9; last 18	36 person-min
One-person proposal	Overlapping lanes infeasible	Rebuild schedule

Plausible wrong turns

1. Elapsed minutes are not person-minutes.
2. The diagram does not prove that any physical process can run one piece at a time.

Evidence of a sound answer

1. Respect stage precedence and each worker's availability.
2. Reconcile all 12 tasks.
3. Separate the numerical model from a real trial claim.

Take the learning back to work

Commitment	Agreed follow-through
Owner	Process owner with the affected workers
Record	Before/proposed transfer schedule and observed trial record
Review	After a bounded trial covering representative request conditions
Verification evidence	Order completion timestamps, actual handling work, quality and worker feedback
If unresolved	Retain required processing constraints; revise the feasible transfer arrangement and rerun the comparison.

Help someone else apply the method

Prepare

1. Six request tokens and three worker lanes
2. Timer or a printed minute grid; separate answer

Minutes	Activity and coaching prompt
4	Declare the rules What must remain identical in the comparison?
8	Move the six tokens Where is R1 waiting although its own task is finished?
9	Build the four-request variant Which tasks happen at the same time on different lanes?
4	Debrief transfer Which omitted real-world condition could change the result?

Debrief

1. Ask a learner to account for every person-minute.
2. Contrast necessary processing batches with a convenient transfer rule.

Individual or remote practice

Draw both schedules to scale and audit each worker lane for overlap before reading the answer.

Connect the method and check its boundaries

Before application

1. One worker per stage
2. No setup, travel or rework in exercise

Outside this lesson

1. Faster elapsed time is not lower labor content
2. Do not force one-piece through inherently batch processes

LEI: Why does one-piece flow matter?

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Flow makes abnormalities visible; support operators when reducing WIP

Method reference; original OPEX scenario and diagram are synthetic teaching content, not source case results.

Open this lesson and its visual aids