Value Stream Map

How-to guide: what the workbook does, how to use it and what every number means. mfgcalcs.com

Value Stream Map

Map a value stream's current and future state and see takt, each step's load, inventory days, lead time, process cycle efficiency and time beyond customer lead time.

For: Lean coordinators, manufacturing engineers and plant managers who map value streams and plan future states.

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Quick start

1. On Setup, type the value stream, monthly demand and working days, shifts, shift length and breaks, the hours in one lead-time day and your customer lead time.
2. On Current State, add one row per process step in flow order: operators, cycle time, value-added time, uptime, the inventory waiting before the step and the transport after it.
3. On Future State, start from the same steps and change what your improvements change: smaller inventories, faster or merged steps, fewer moves.
4. Open the Dashboard to compare lead time, process cycle efficiency and each step's load against takt, today and in the future state.

What is in the workbook

Start Here	Read this first: what the workbook does and how to use it.
Setup	The value stream, customer demand, available time and takt, and the lead-time settings.
Current State	One row per process step in flow order, as the stream runs today: walk it and count the inventory.
Future State	The same steps after the changes you plan: smaller inventories, faster or merged steps, fewer moves.
Dashboard	The value stream today and in the future state: lead time, process cycle efficiency, inventory and each step's load against takt.
Method	How every number is calculated, with assumptions, limits and sources.
Verify	Self-check: the workbook's formulas recomputed on fixed inputs against an independent reference.
About MFG Calcs	Everything MFG Calcs offers, free: calculators, templates, tariff tools, data and the Calkee AI helper.

What each number means

Quantity	How it is calculated	Units

Quantity	How it is calculated	Units
Daily demand and takt	Daily demand = monthly demand / working days. Takt = available seconds per day / daily demand, where available time = shifts x (shift length - breaks).	units/day, s
Wait	Inventory before the step / daily demand: the days a part waits there at the customer's pace (Little's law).	days
Effective cycle and load	Effective cycle = cycle time / uptime; load = effective cycle / takt. Over capacity above 100%, Near capacity from the Setup threshold.	s, %
Step lead time and lead time to here	Wait + value-added seconds / 3,600 / hours per lead-time day + transport hours / hours per lead-time day; lead time to here sums the steps up to this one.	days
Lead time	Waiting days + transport days + value-added days over every step, as the live Value Stream Lead Time calculator defines it.	days
Process cycle efficiency	Value-added days / lead time.	%
Beyond customer lead time	MAX(0, lead time - customer lead time): the part of the lead time customers will not wait for, covered by finished stock or delivered late.	days

Assumptions, limitations, sources and the self-check (the Verify sheet, which recomputes the workbook's formulas on fixed test inputs) are in the workbook. The last page shows the Dashboard with the example data for Wharfedale Valves, a fictional business.

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Engineering estimates for planning and improvement work. Verify the results against your own process, data and standards before you rely on them.

Value Stream Map

The value stream today and in the future state: lead time, process cycle efficiency, inventory and each step's load against takt.

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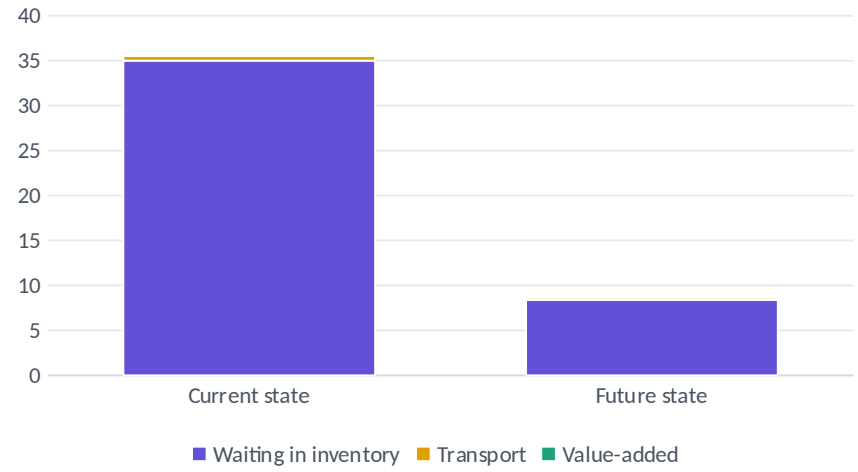
VB-40 valve body, bar stock to shipping: demand 480.0 units a day, takt 112.5 s, 16 h per lead-time day, customer lead time 10 days.

LEAD TIME TODAY (DAYS)	LEAD TIME, FUTURE STATE (DAYS)	PROCESS CYCLE EFFICIENCY TODAY	PROCESS CYCLE EFFICIENCY, FUTURE
35.6	8.7	0.20%	0.80%
Waiting + transport + value-added	Customer lead time 10.0	Value-added days / lead time	Value-added days / lead time
	On target		

Lead time, today and future state (days)



Effective cycle time against takt, by step (s)

