Earned Value: CPI, SPI, EAC and Variances

Cost and schedule variances, cost and schedule performance indices, estimate at completion, estimate to complete, variance at completion and TCPI of a project.

Method: Industrial engineering practice (work study, line balancing, quality and project management)

Input parameters

Unit system: SI

Parameter	Value	Unit
Budget at completion	1,000,000	
Planned value to date	400,000	
Earned value to date	350,000	
Actual cost to date	380,000	

Calculated results

Parameter	Value	Unit
Cost variance EV − AC	-30,000	
Schedule variance EV − PV	-50,000	
Cost performance index	0.92105	
Schedule performance index	0.87500	
Estimate at completion BAC/CPI	1,085,714	
Estimate to complete	705,714	
Variance at completion	-85,714	
CPI needed on the remaining work to meet BAC	1.0484	

Notes for this case

• Earned value compares the budgeted cost of work done (EV) with what was planned (PV) and what it cost (AC). CPI below 1 means over budget, SPI below 1 behind schedule. If the cost performance so far continues, the project will cost BAC/CPI; TCPI shows the efficiency the remaining work needs to come in on budget, and values well above 1.1 are rarely achieved. Other EAC formulas (AC + BAC − EV, or using CPI × SPI) suit other assumptions.

Formula and method

$$CPI = \frac{EV}{AC}, \quad SPI = \frac{EV}{PV}, \quad EAC = \frac{BAC}{CPI}, \quad TCPI = \frac{BAC - EV}{BAC - AC}$$

Variables

BAC	Budget at completion	-
PV	Planned value to date	-
EV	Earned value to date	-
AC	Actual cost to date	-
CV	Cost variance EV − AC	-
SV	Schedule variance EV − PV	-
CPI	Cost performance index	-
SPI	Schedule performance index	-
EAC	Estimate at completion BAC/CPI	-
ETC	Estimate to complete	-
VAC	Variance at completion	-
$TCPI$	CPI needed on the remaining work to meet BAC	-

Method and standards

Earned value.

Assumptions and limits

- Current CPI continues.

References

Industrial engineering practice (work study, line balancing, quality and project management)

Report details

Report reference	FCC-3NF4-F6SJ (the same inputs always give the same reference)
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Calculator	Earned Value: CPI, SPI, EAC and Variances
Method last reviewed	17 November 2026
Software release	FireCAD Calc, release of 22 November 2026
Release checks	3 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/general/economics/earned-value-management

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.