

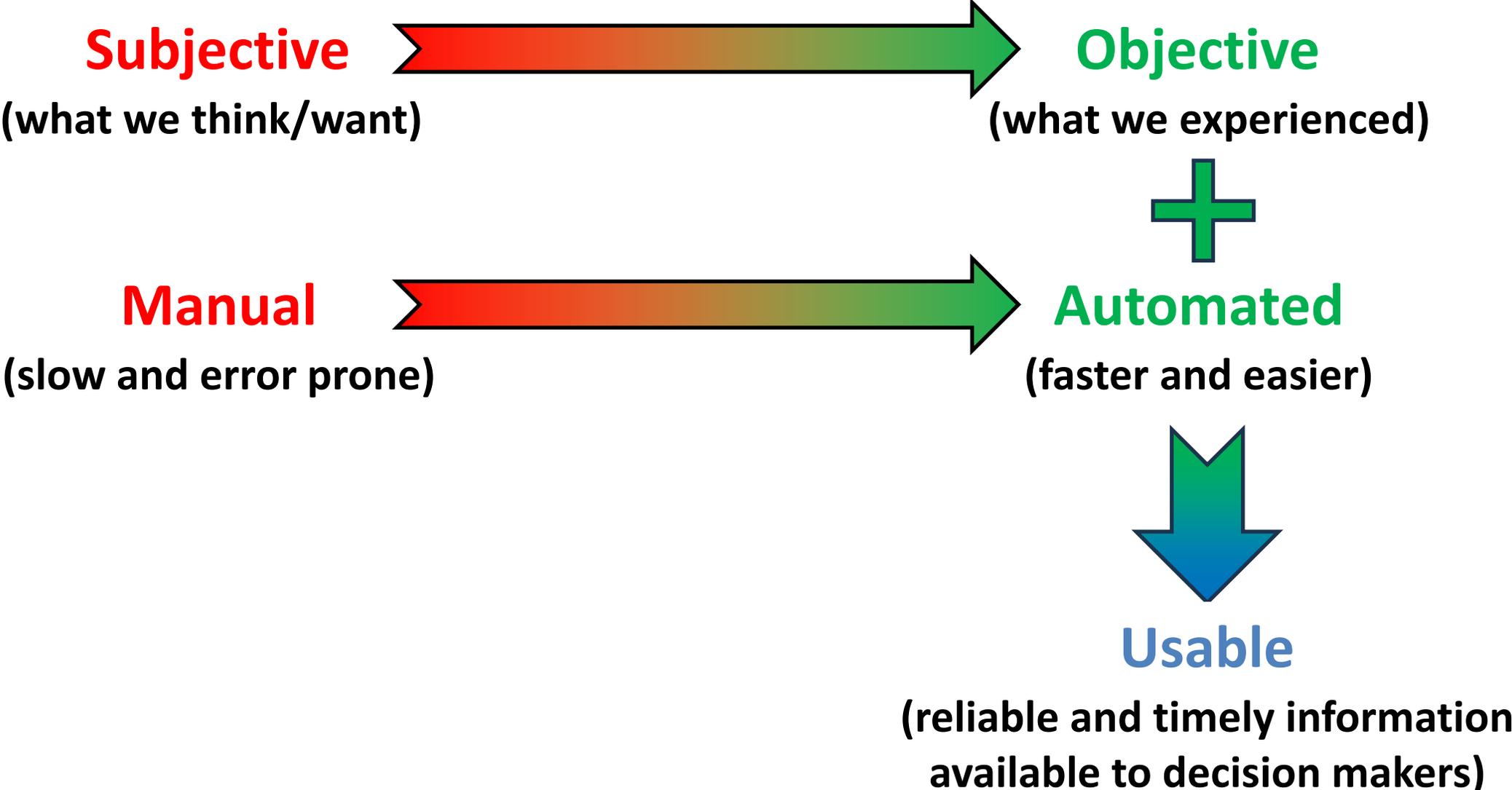


Things You Don't See in the PASEG (yet)

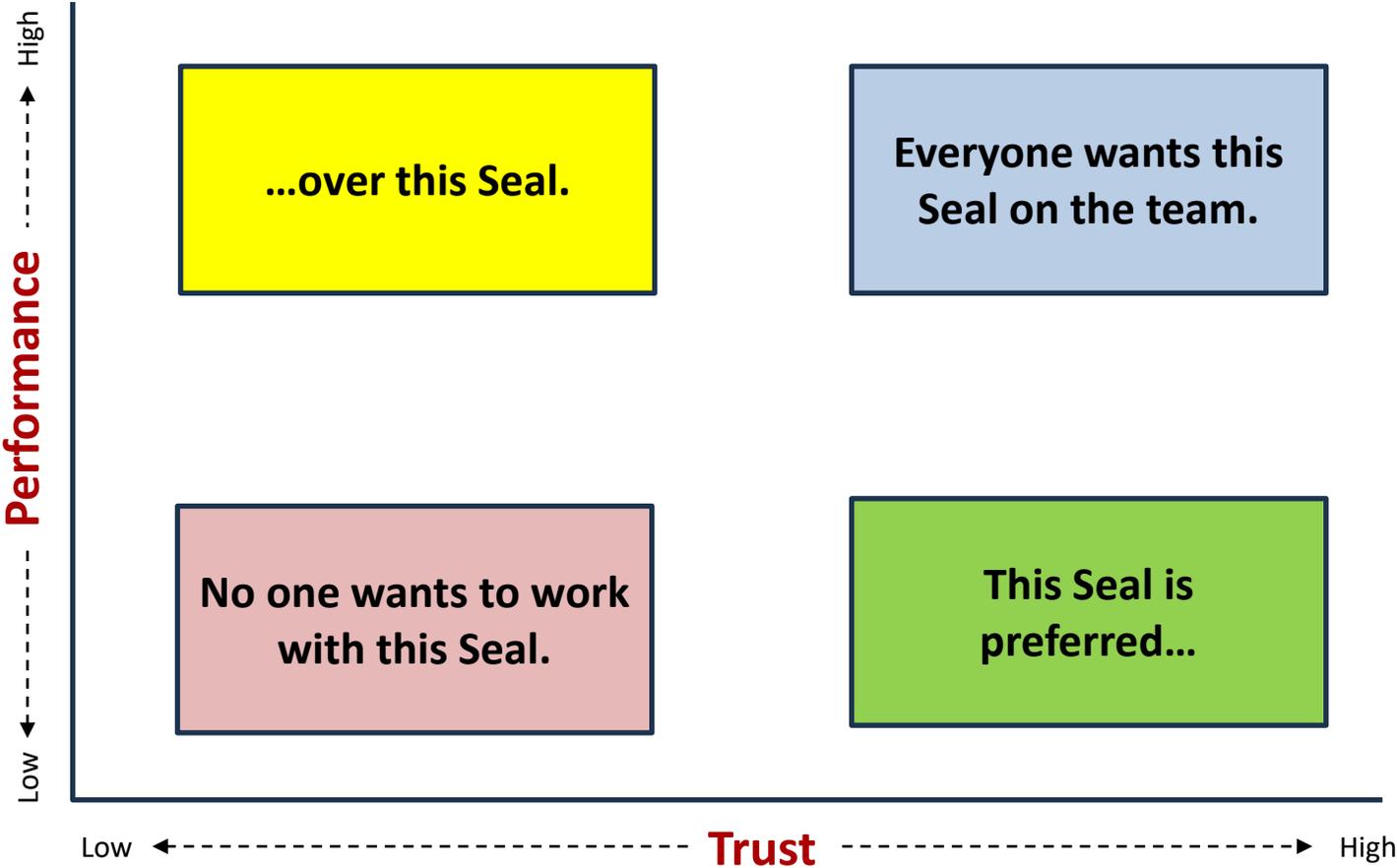
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September 13, 2023

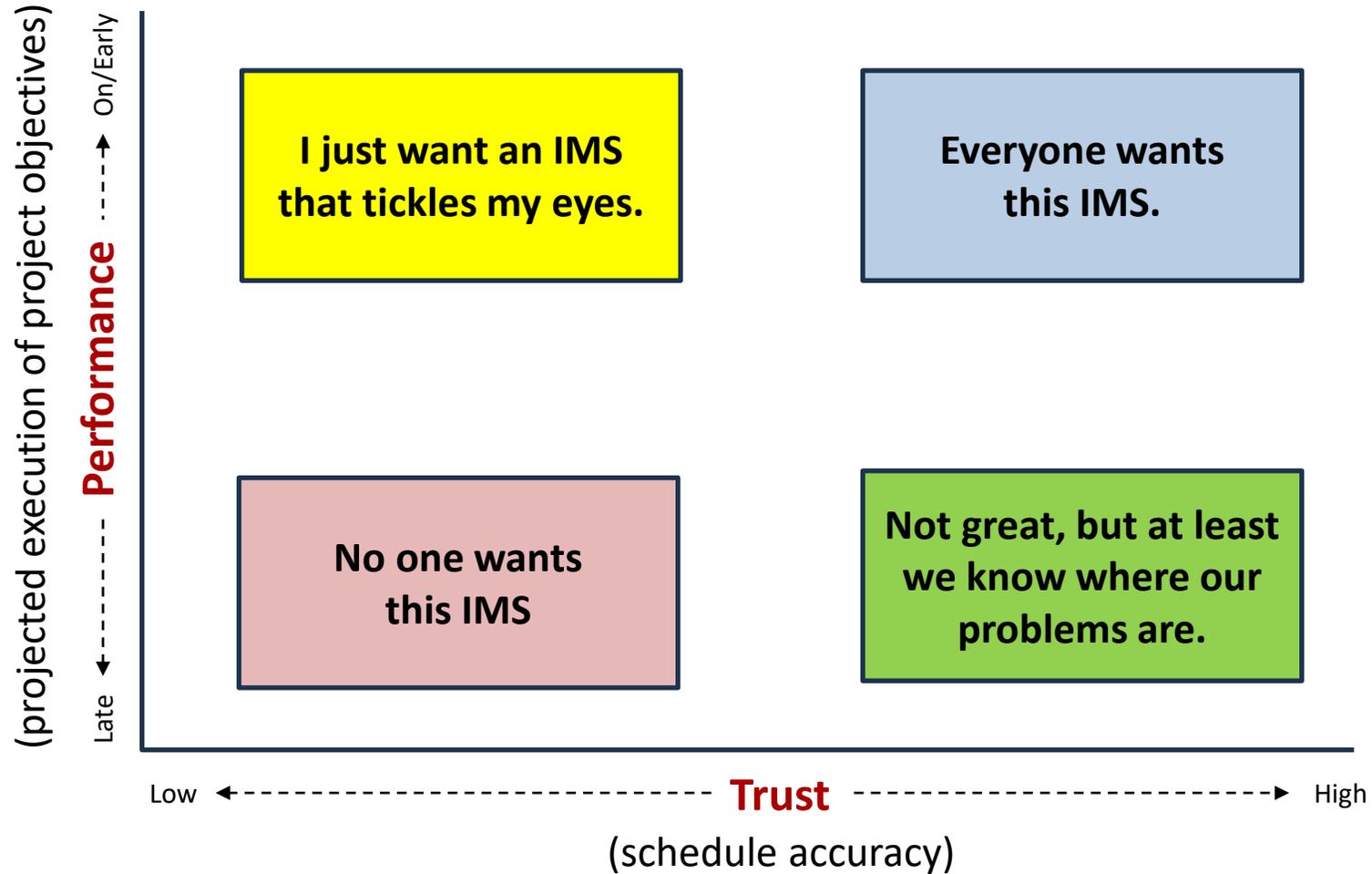
Forecasting Scheduling



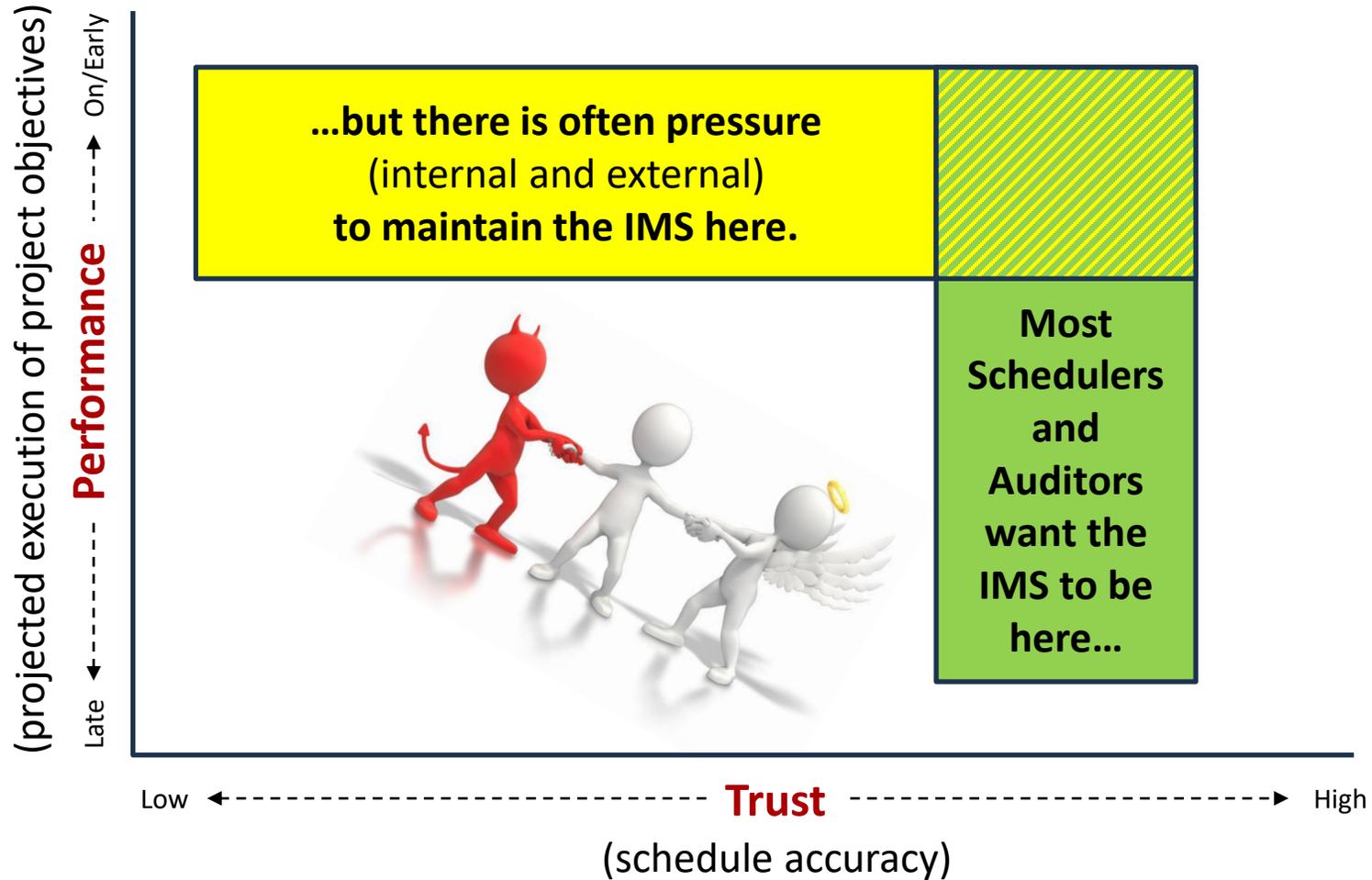
Navy Seals



Integrated Master Schedule



Integrated Master Schedule



IMS Components



Objective

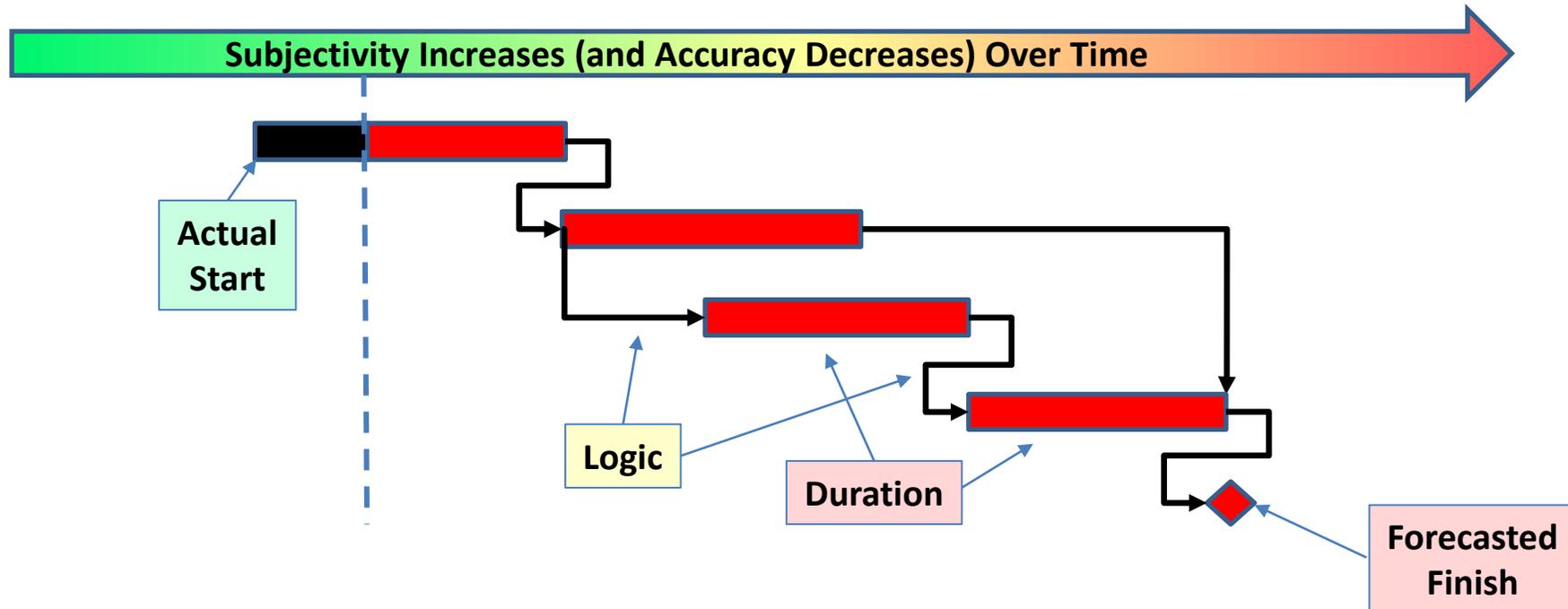
- Actual Start
- Actual Finish

Objective/Subjective

- Percent Complete
- Task Logic

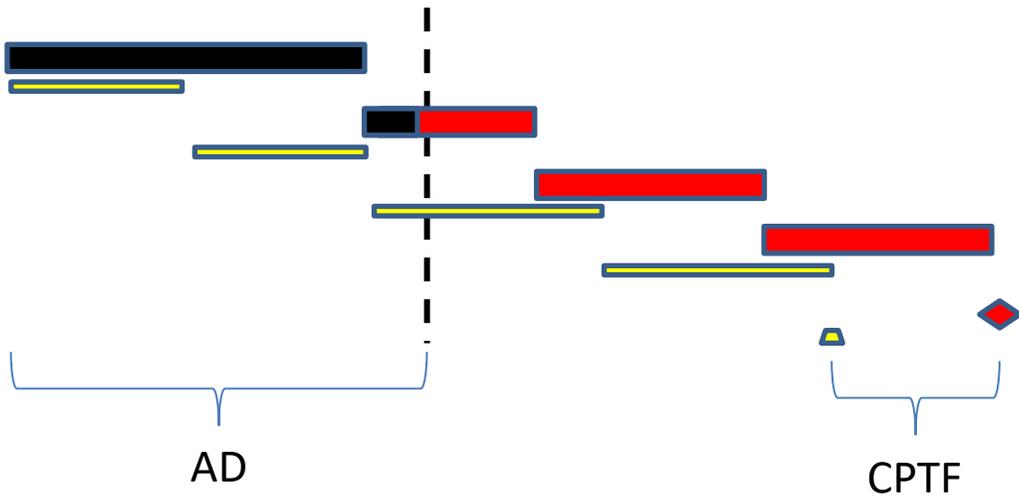
Generally Subjective

- Estimate to Complete
- Remaining Duration
- Forecast Start
- Forecast Finish



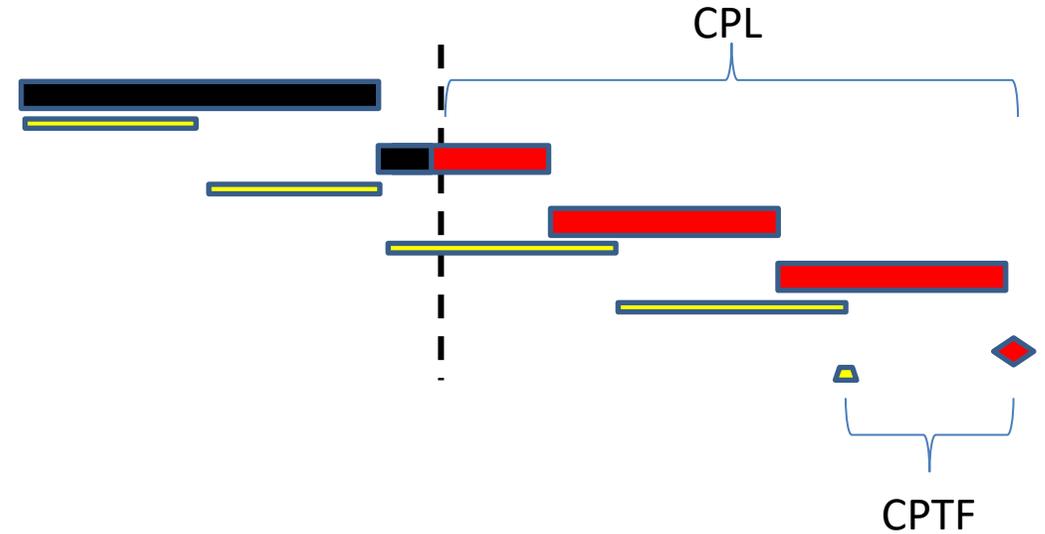
TFCI & CPLI Overview

Total Float Consumption Index (TFCI)



$$TFCI = \frac{PAD + CPTF}{PAD}$$

Critical Path Length Index (CPLI)



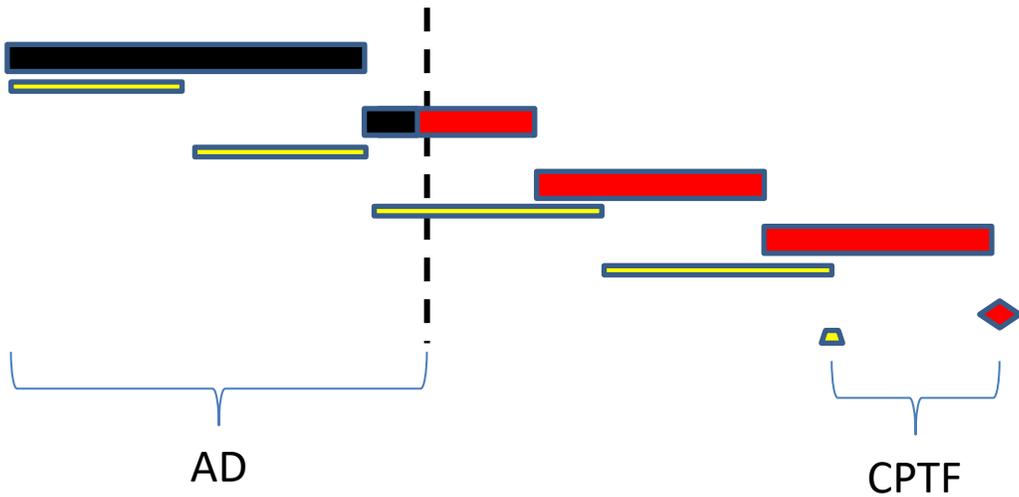
$$CPLI = \frac{CPL + CPTF}{CPL}$$

Actual		Critical Path	
Baseline		Due Date	

PAD – Project Actual Duration
CPTF – Critical Path Total Float
CPL – Critical Path Length

TFCI & CPLI Flaws

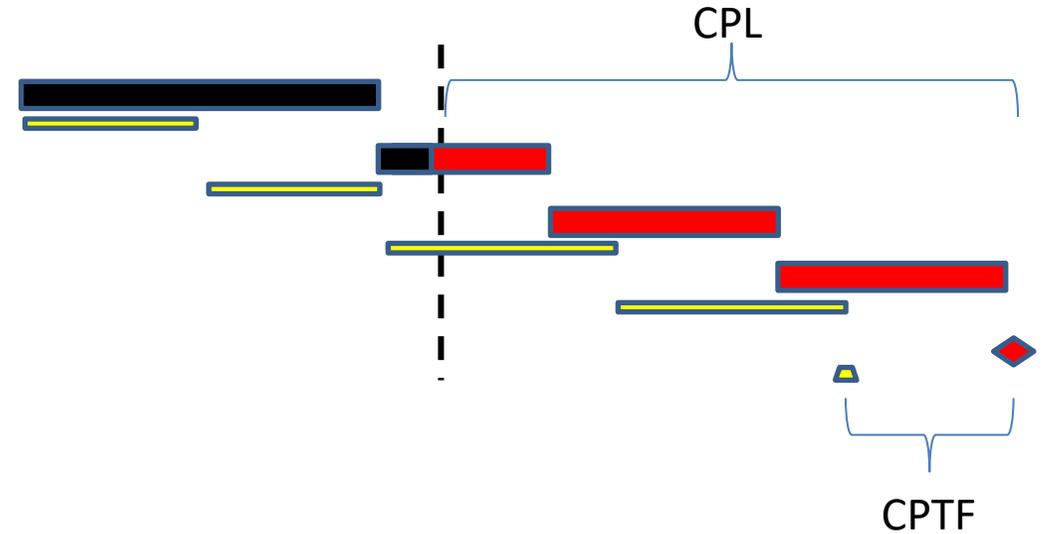
Total Float Consumption Index (TFCI)



$$TFCI = \frac{PAD + CPTF}{PAD}$$

Subjectivity Increases (and Accuracy Decreases) Over Time

Critical Path Length Index (CPLI)



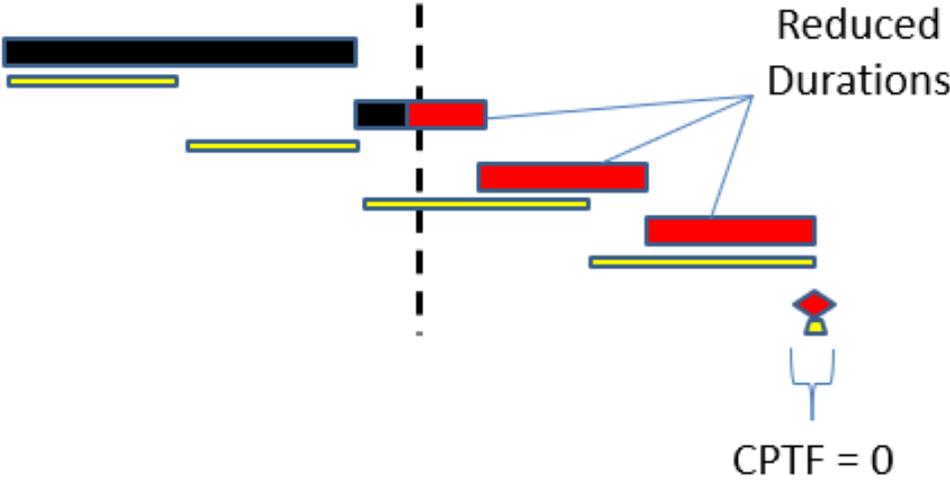
$$CPLI = \frac{CPL + CPTF}{CPL}$$

Subjectivity Increases (and Accuracy Decreases) Over Time

The "Key Ingredient" (total float) to both TFCI and CPLI is highly subjective

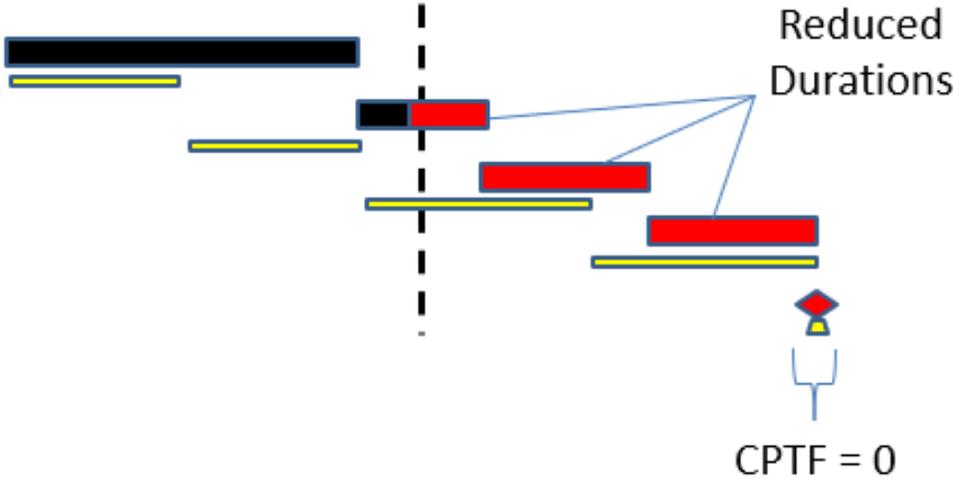
Can You (instantly) Improve TFCI & CPLI?

Total Float Consumption Index (TFCI)



$$TFCI = \frac{PAD + 0}{PAD} = \frac{PAD}{PAD} = 1.0$$

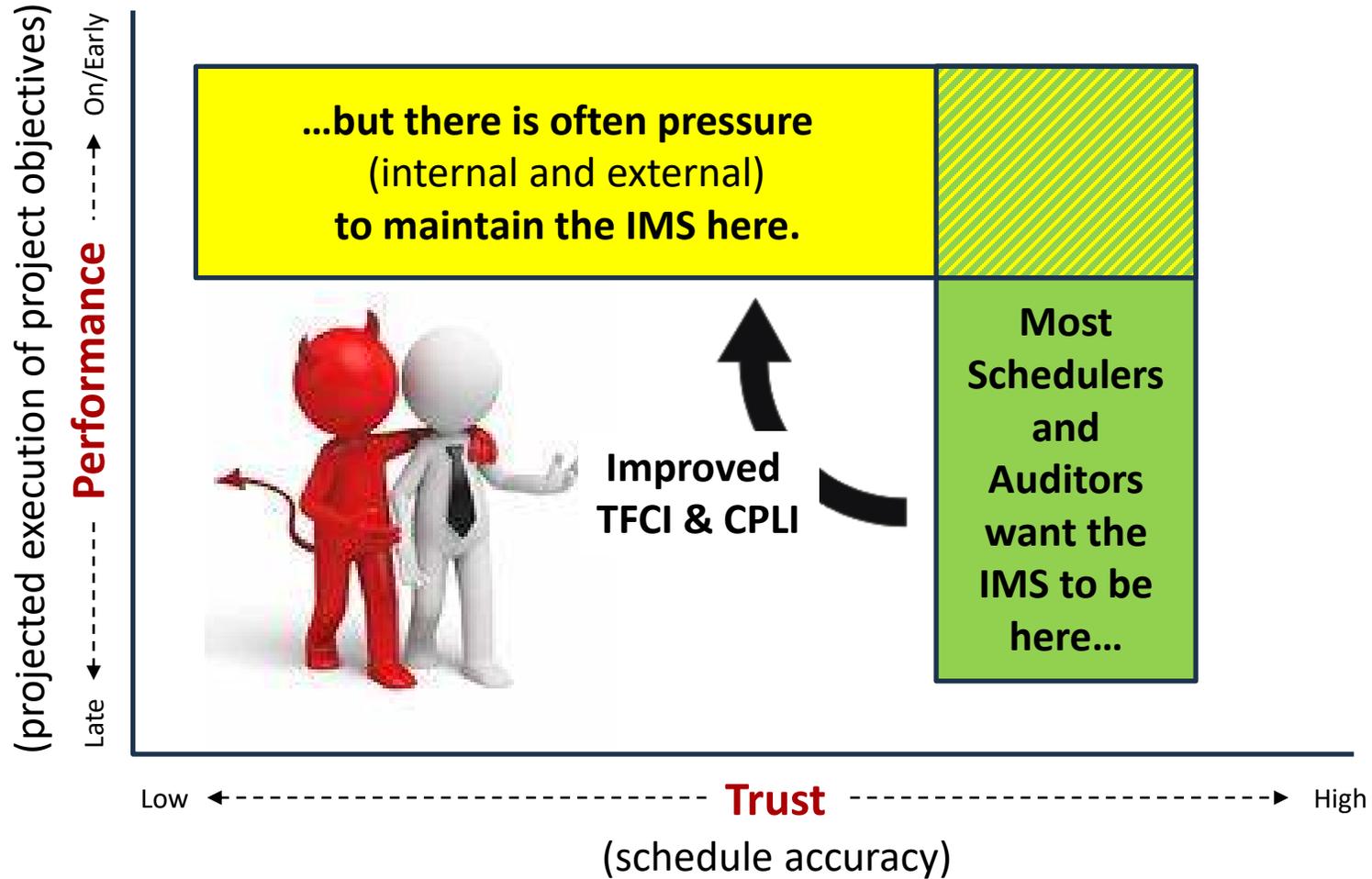
Critical Path Length Index (CPLI)



$$CPLI = \frac{CPL + 0}{CPL} = \frac{CPL}{CPL} = 1.0$$

Even though poor past performance may indicate increased forecasted durations, cutting durations until the project finishes on time will yield a “perfect” score

TFCI & CPLI Can Reward Poor Practices

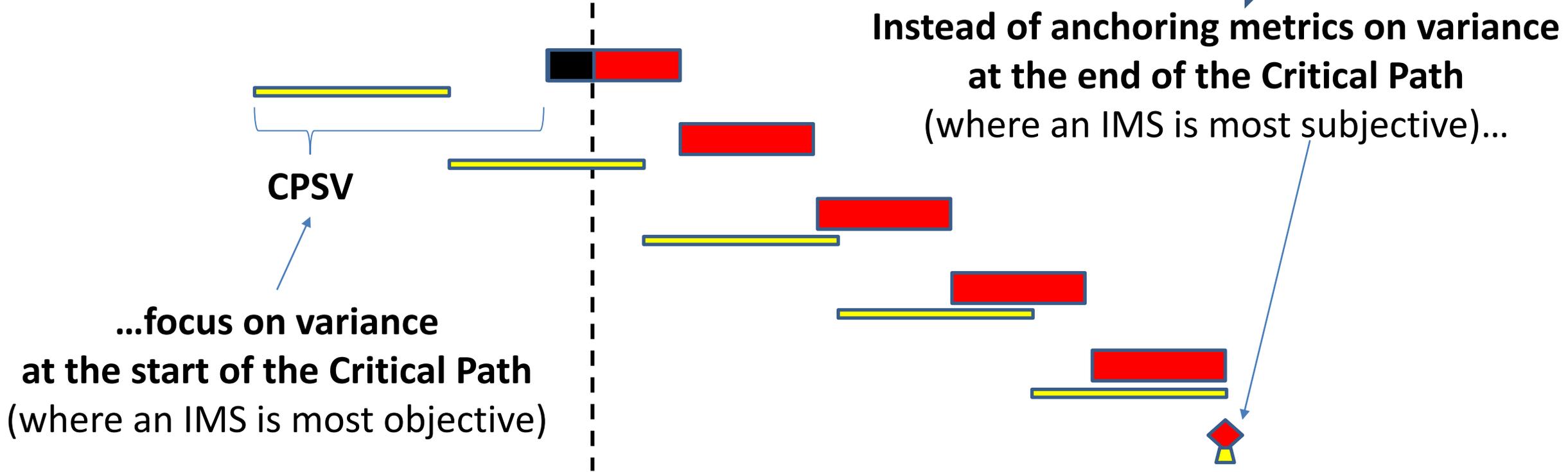


You can do bad things to your IMS (unrealistically short forecasts) to improve TFCI & CPLI

Shifting Focus



Subjectivity Increases (and Accuracy Decreases) Over Time



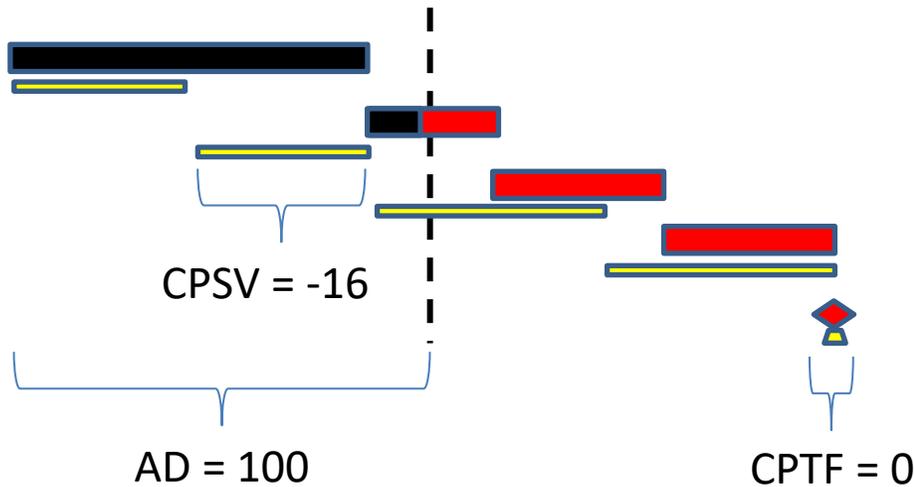
$$(adjusted)TFCI = \frac{PAD + CPSV}{PAD} \qquad (adjusted) CPLI = \frac{CPL + CPSV}{CPL}$$

CPSV – Critical Path Start Variance

(Difference between the baseline and actual/forecasted start of the Critical Path)

(adjusted) TFCI & CPLI Calculations

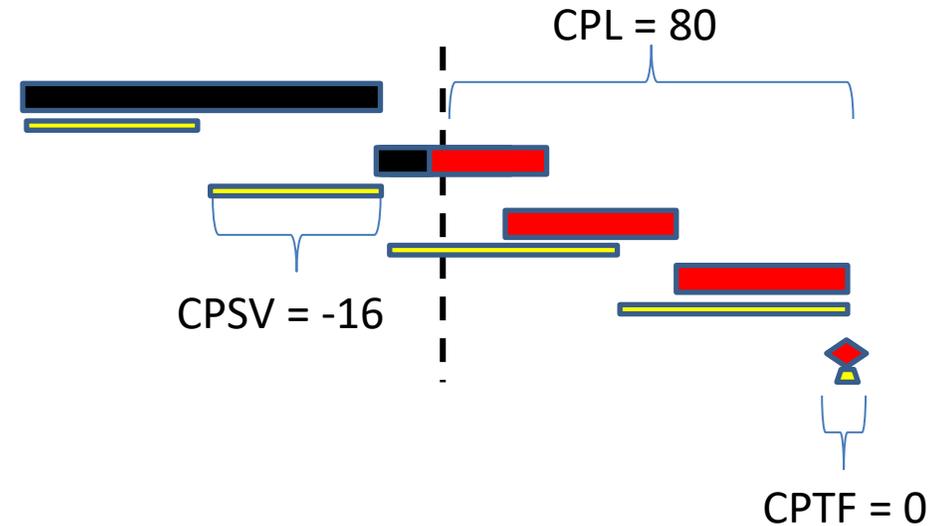
Total Float Consumption Index (TFCI)



$$TFCI = \frac{PAD + 0}{PAD} = \frac{100}{100} = 1.0$$

$$(adjusted) TFCI = \frac{PAD + (-16)}{PAD} = \frac{84}{100} = .84$$

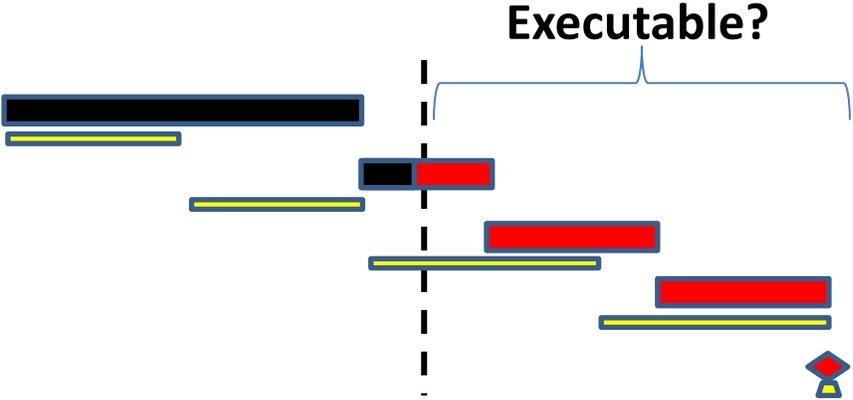
Critical Path Length Index (CPLI)



$$CPLI = \frac{CPL + 0}{CPL} = \frac{80}{80} = 1.0$$

$$(adjusted) CPLI = \frac{CPL + (-16)}{CPL} = \frac{64}{80} = .80$$

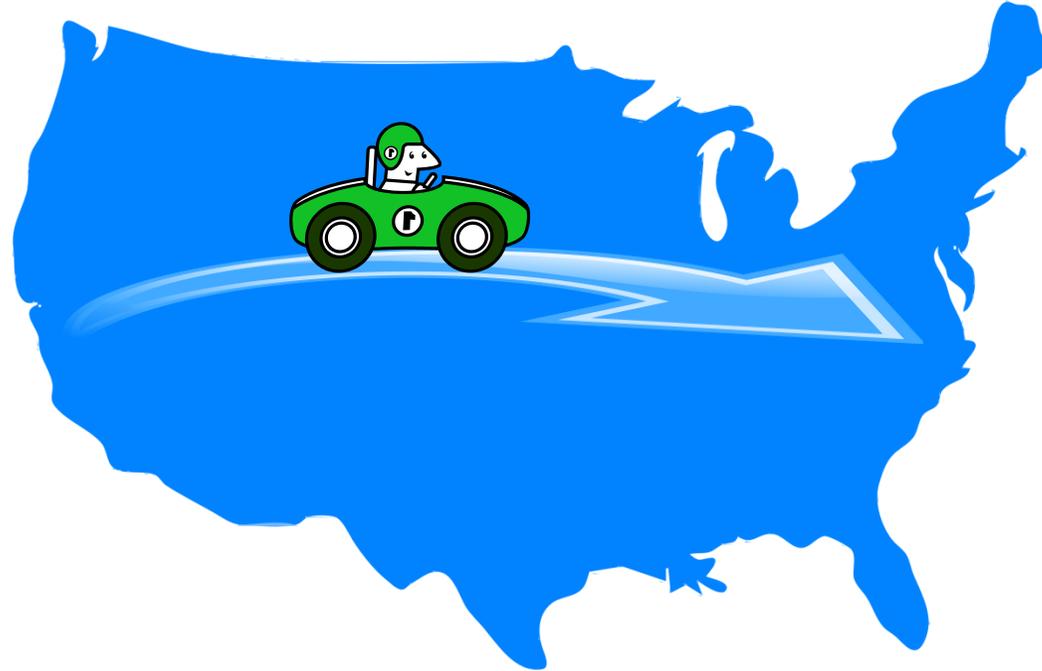
Challenging Forecasts



But if downstream forecasts seem improbable, how can we estimate a more realistic completion?

What is an IECD?

Son says he will arrive in time for Thanksgiving Dinner (6pm)



So far he is averaging 50 mph

If he drives 50 mph the rest of the way, he will arrive at **8:30pm**

Will he make it?

IECD – Independent Estimated Completion Date

What is an IECD?

**Most IECDs apply past (demonstrated) performance,
to the remaining work to calculate an independent
estimated completion date (IECD)**



But there is more than one way to measure past
schedule performance (and remaining work)...

Independent Estimated Completion Date (IECD)

- **Objective**
 - Most are based on past (observed) performance
- **Fast**
 - After initial set-up, they can often be run with little/no recurring effort
- **Accurate?**
 - Good question. Let's explore more.

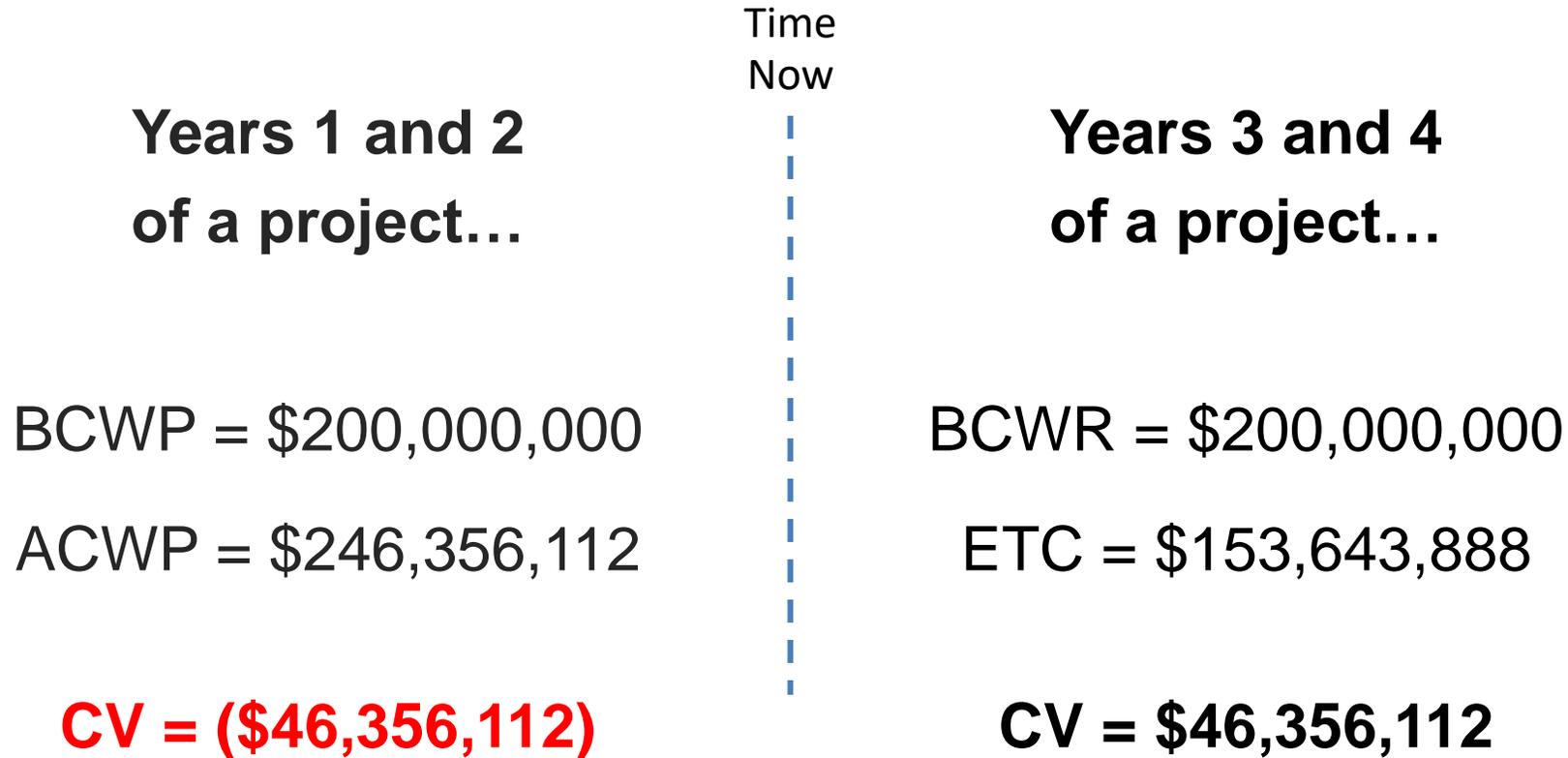
Do you trust your schedule?

- How do you know if Subcontractor schedules are realistic?
- Even well-intentioned CAMs can provide overly optimistic (or pessimistic) forecasts.
- Are we marching to a deliverable requirement that is unachievable?

Bottom Line:

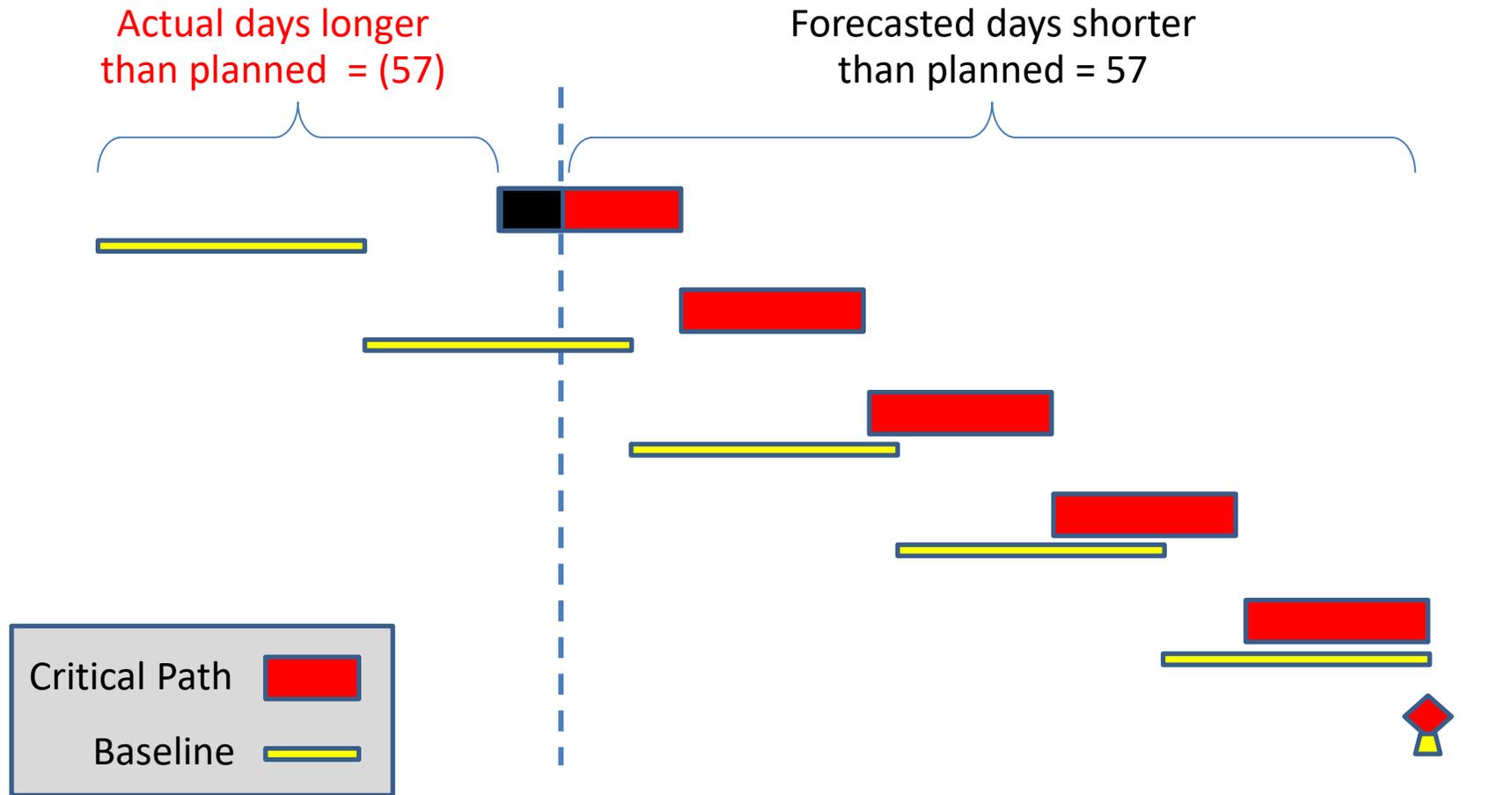
A schedule can be made to say almost anything!

Would you believe this?



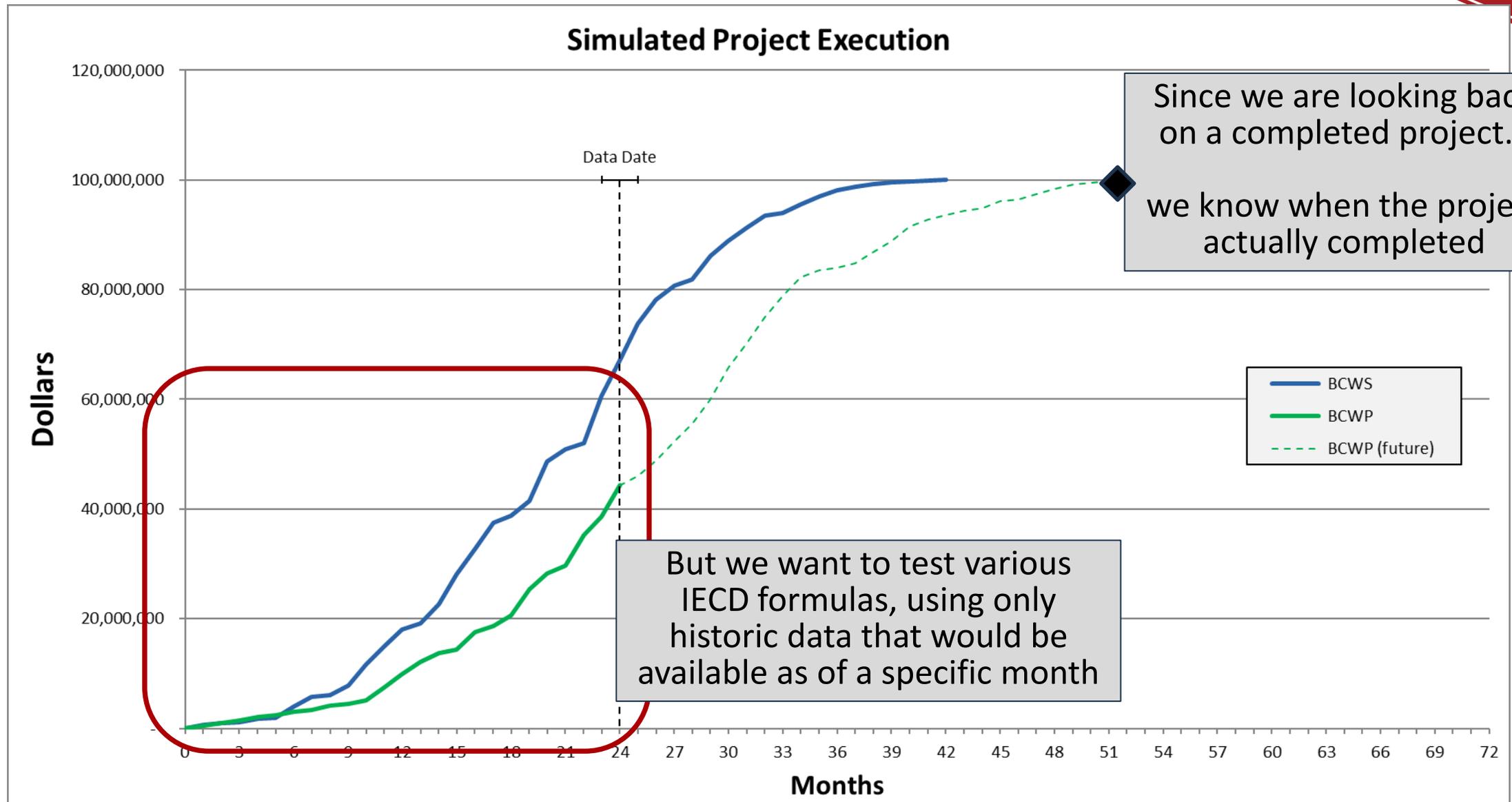
VAC = Perfect!

How about this?

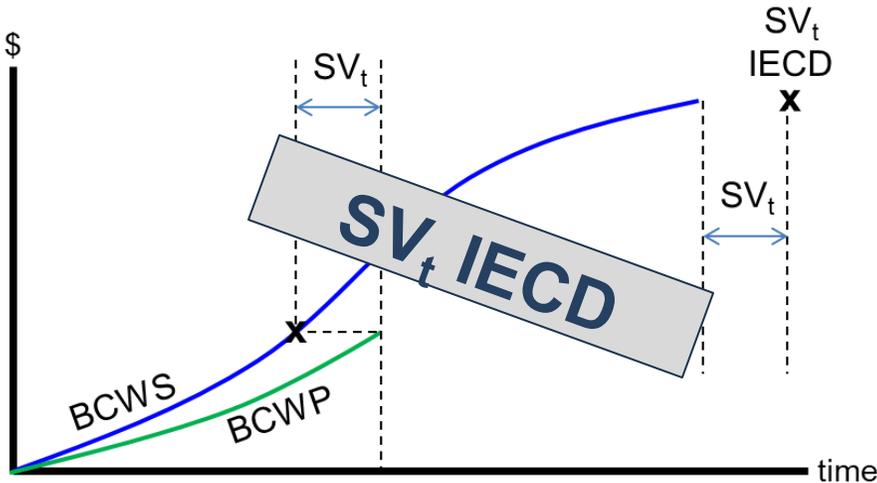
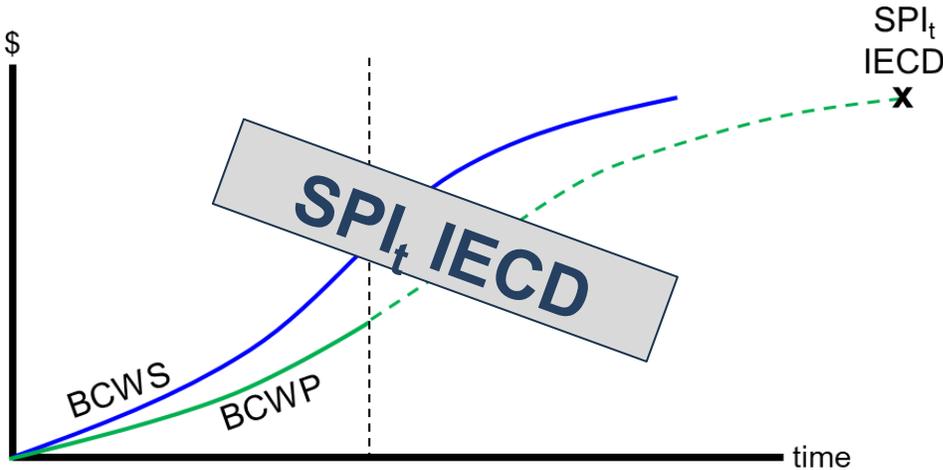
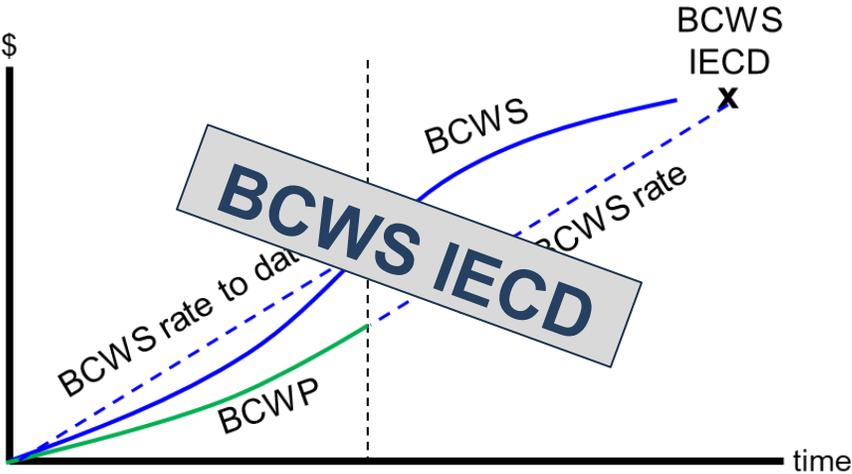
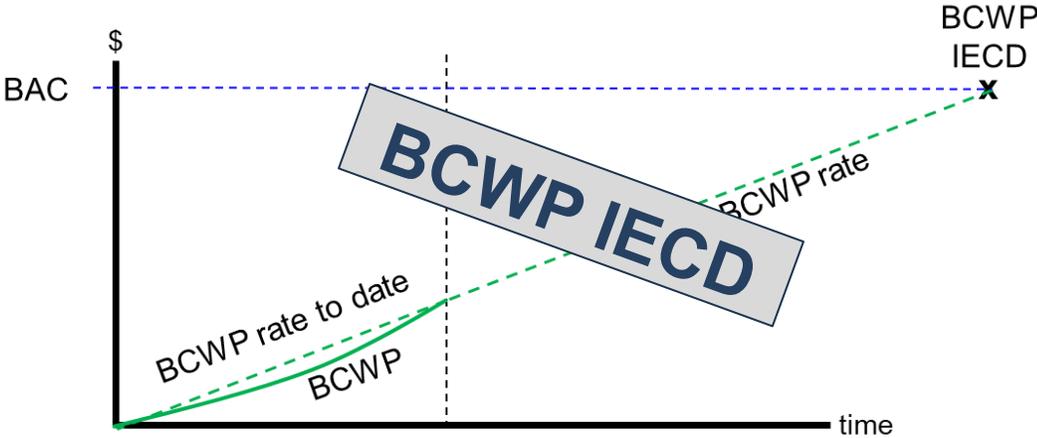


Project Completion = Perfect!

Simulated Project Data



There are Many IECD Formulas



Questions to Answer

- Is one type of IECD consistently more accurate?
- When a formula uses an “average”, over what period should that average be taken?
- Are some IECDs better early in the project, and others later?
- Does it matter is the project is running early or late?

BCWS Based:

$$IECD = Time\ Now + \frac{BCWR}{BCWS_{cur}}$$

$$IECD = Time\ Now + \frac{BCWR}{BCWS_{avg}}$$

BCWP Based:

$$IECD = Time\ Now + \frac{BCWR}{BCWP_{cur}}$$

$$IECD = Time\ Now + \frac{BCWR}{BCWP_{avg}}$$

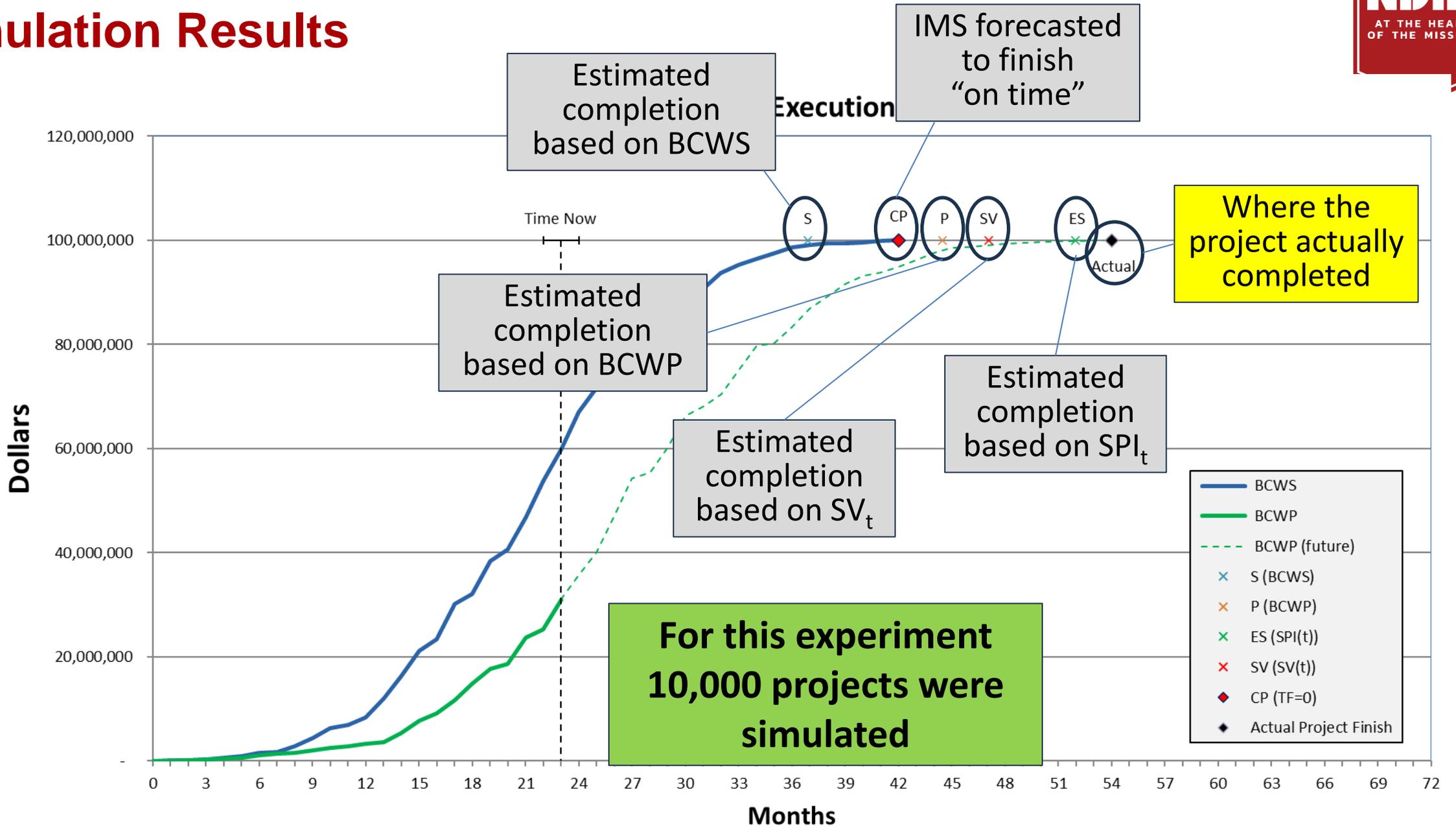
Earned Schedule Based:

$$IECD = Time\ Now + \frac{PDWR}{SPI(t)}$$

$$IECD = Time\ Now + \frac{PDWR}{SPI(t)_{avg}}$$

$$IECD = Time\ Now + PDWR$$

Simulation Results



One More Caveat

Additional real-world considerations not modeled in these simulations:

- Shift in project phases (i.e. Design to Manufacturing)
- Start/finish of subcontracted effort
- “Reset” events (OTB/OTS, single-point adjustments)
- Significant changes in resources (more, less, skill)
- Heroic efforts

**These are all considerations when determining the trend window
(i.e. 2-month average vs. 6-month average)**

IECD Simulation Results

How often did each IECD formula predict closest to the actual project completion?

- BCWS – 2.96%
- BCWP – 11.68%
- Don't Worry we will finish "On Time" – 13.63%
- SV_t – 29.56% (most stable)
- SPI_t – 42.17% (most accurate)



Not an IECD
(just a typical IMS)

The goal of an IECD is not to replace the IMS, but to spur conversations on IMS reliability

This Is the Future of Scheduling (not the now)

- **This presentation is not intended to provide final answers**
 - But hopefully some more paths to explore



Questions

