

# Effective Management of Capital Projects – Cost Containment and Key Performance indicators (KPI)



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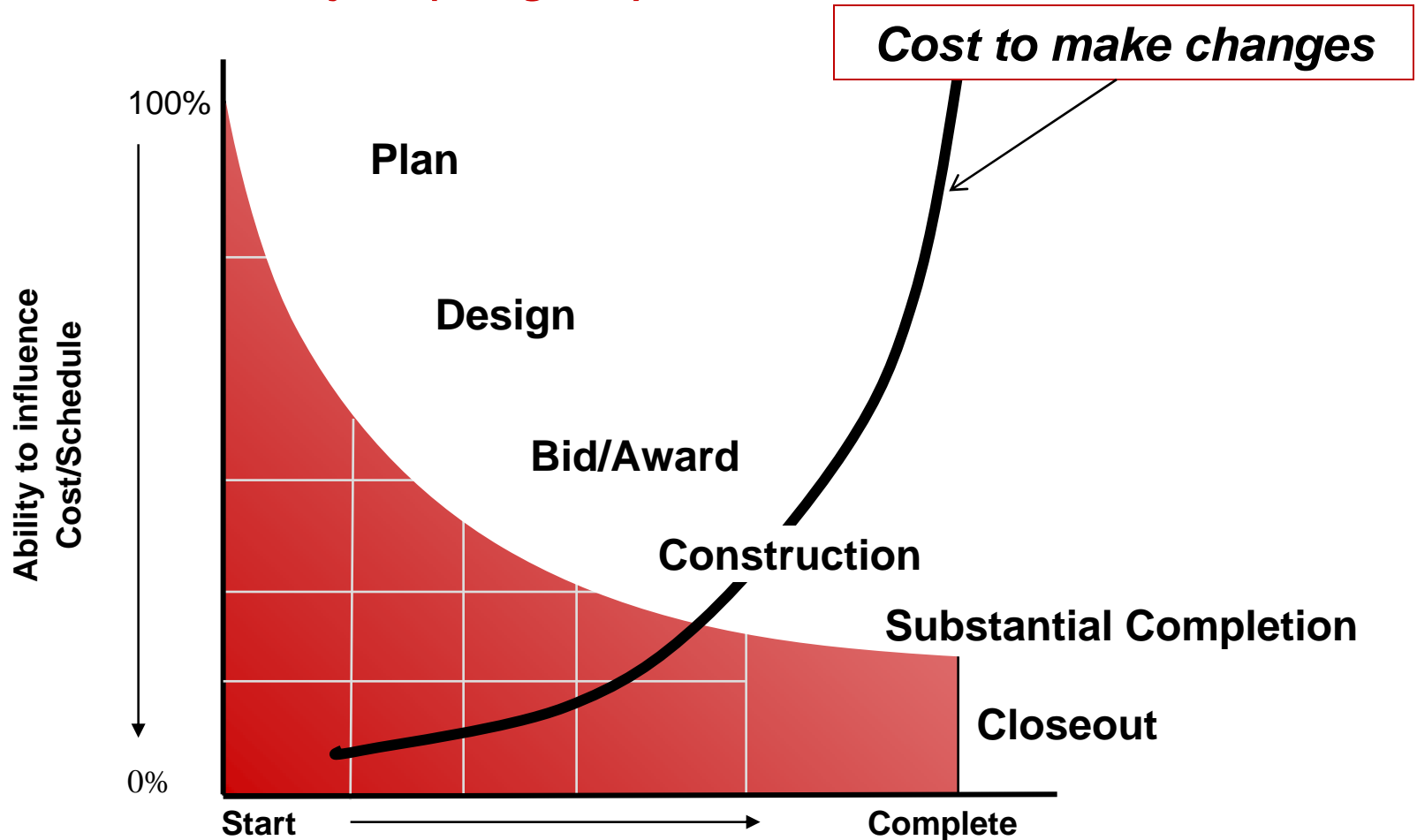
# Objectives

1. Understand root causes of cost and schedule issues on capital project/programs
2. Evaluate areas of study to implement a proactive cost management and schedule control environment
3. How to use of Key Performance Indicators (KPI) to manage capital projects

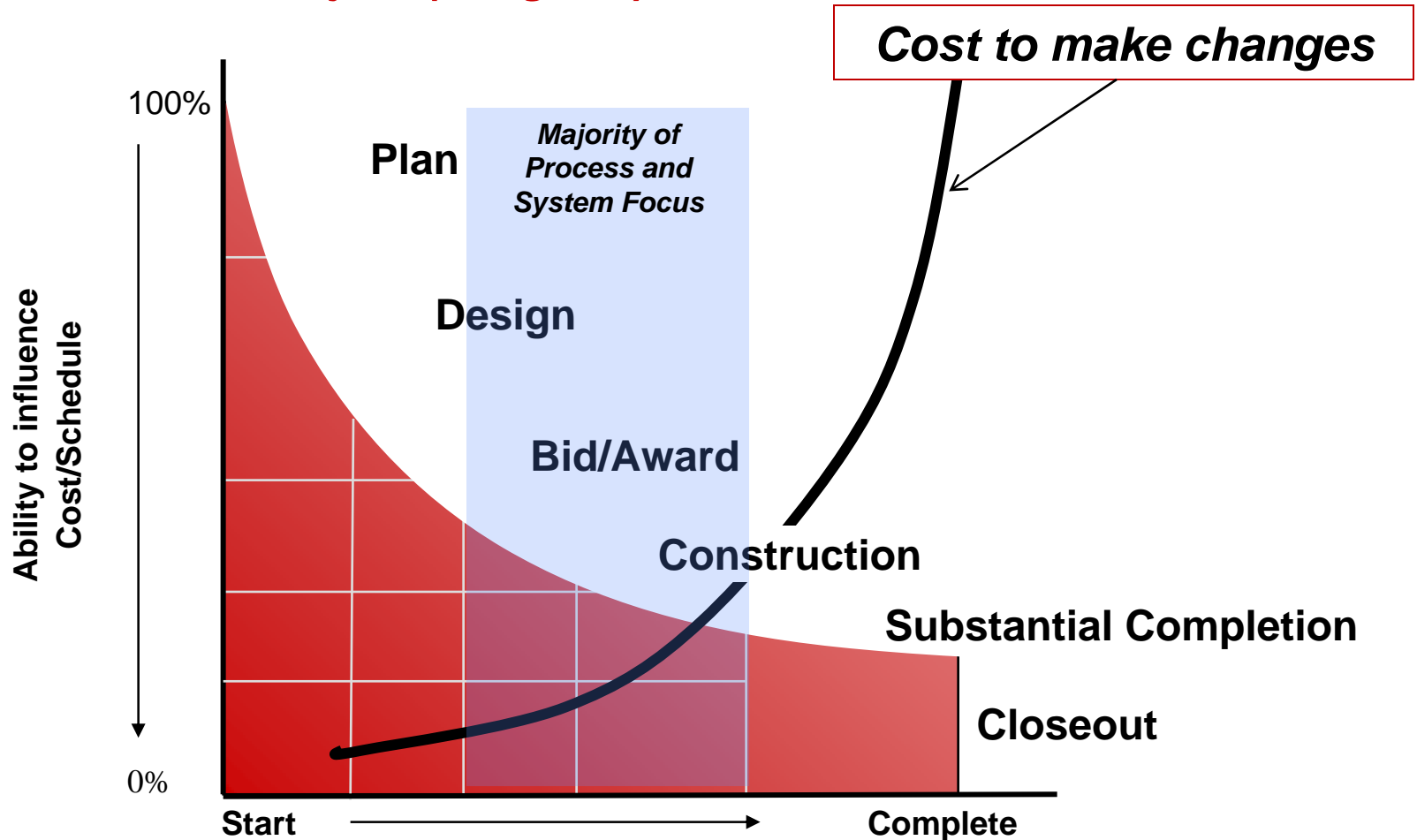
# Root Causes of Cost and Schedule Overruns on Capital Projects

Symptom	Root Cause
Projects consistently over budget	<ul style="list-style-type: none"> <li>(1) Unclear project definition</li> <li>(2) Scope creep during design and/or construction</li> <li>(3) Misalignment of scope/funding</li> <li>(4) "Annual budget" approach vs. project cost (across budget years)</li> </ul>
Projects consistently run past completion milestones	<ul style="list-style-type: none"> <li>(1) Lengthy procurement cycles</li> <li>(2) Unclear project definition</li> <li>(3) Scope creep</li> <li>(4) Award of time instead of enforcing liquidated damages</li> <li>(5) Lack of right fund source to fully fund project</li> </ul>
Lack of appropriate funding source to fund project	<ul style="list-style-type: none"> <li>(1) Scope and eligibility review not performed throughout cycle</li> <li>(2) Scope creep</li> <li>(3) Unclear project definition</li> </ul>

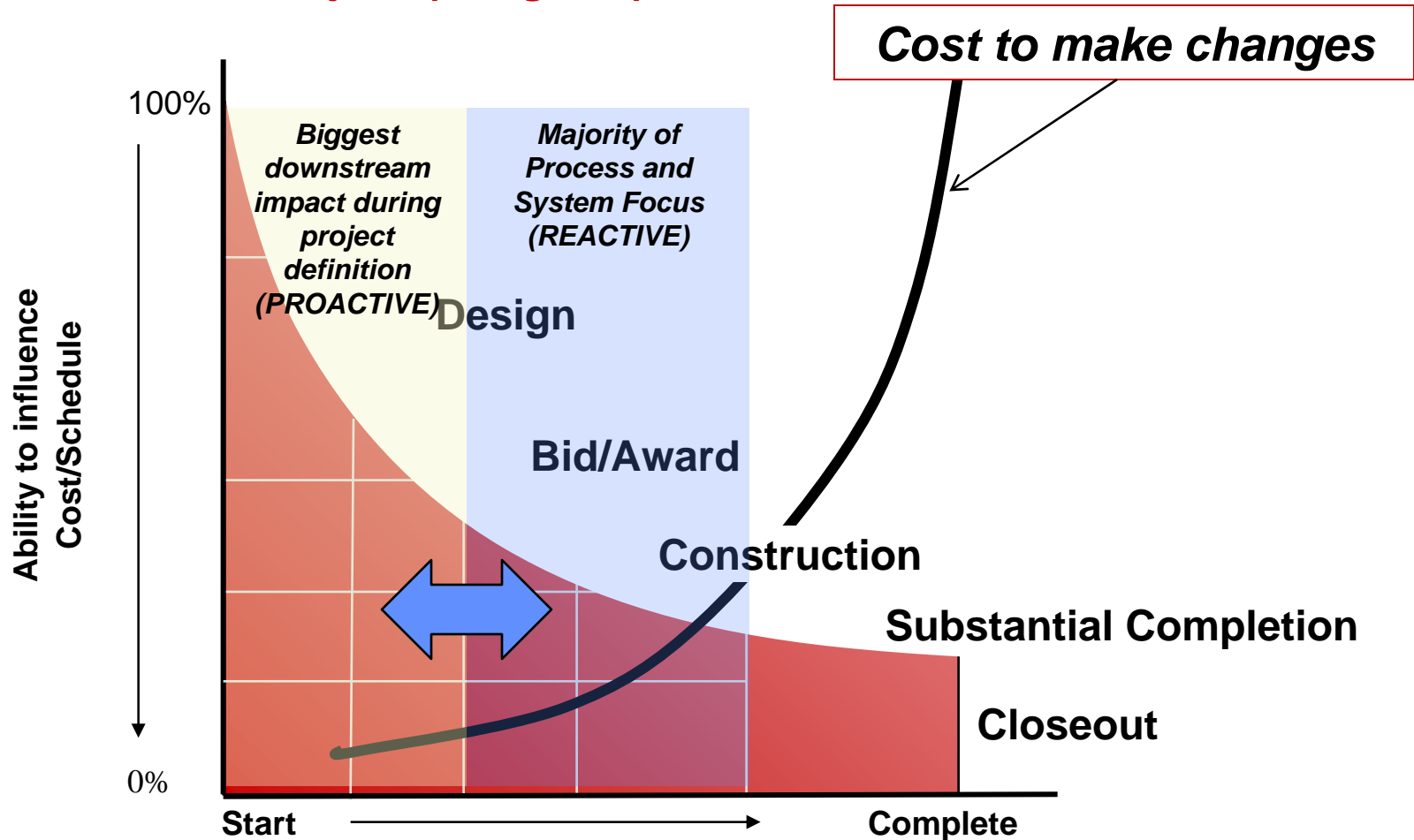
## Construction Project (Program) Influence Curve



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## Many management and IT systems are focused on areas subsequent to project definition (design and construction)

1. Fundamental positive change downstream can most dramatically be performed during project definition (PROACTIVE PHASE)
  - AREAS of FURTHER ANALYSIS:
    - Standardized project definition with standardized unit pricing to develop project budgets
    - Involve Engineering/Construction and Finance during project definition process both have insights that are critical downstream
    - Explicit process for project definition with clear deliverable (e.g. inclusion in CIP or capital project)

## Many management and IT systems are focused on areas subsequent to project definition (design and construction)

2. From the moment design starts to the end of construction organizations perform cost and schedule containment in a defensive mode. Defensive in that contracts have been awarded and the only areas to contain are
    - (a). Management of contingency
    - (b). Scope creep/change orders
    - (c). Schedule (\$)
- AREAS of FURTHER ANALYSIS:
- Industry leading practices for managing change orders (eligibility/compliance prior to approval)
  - Use of Key Performance Indicators

## Key Performance Indicators (KPI)

1. KPIs are measures of project performance
2. KPIs can be developed to measure various areas of project performance

KPI	Area Measured
<i>% Change Order Value/Original Contract Value</i>	Variability from contracted (base) scope of work (either design or construction)
# of Activities on critical path/total activities in schedule	Ability to complete project on time/project criticality
% \$ expended (paid) / % time expended	Ability to place work within contracted time parameters (throughput)
% contingency used / % time expended	Rate of contingency use given contracted time

3. For each KPI thresholds can be developed to create dashboard reports

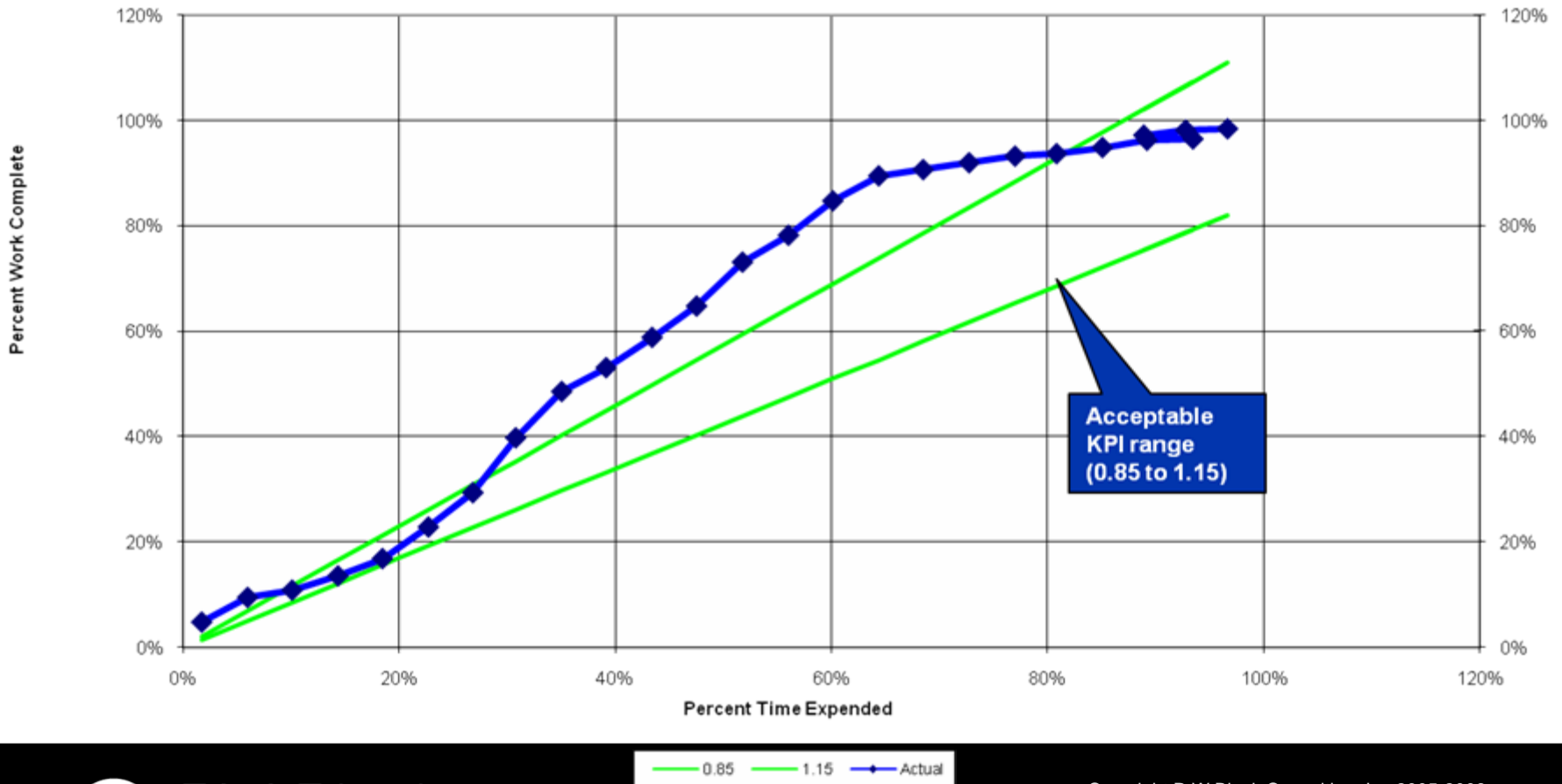
## How to Use Key Performance Indicators (KPI)

### Example: % \$ expended (work in place) / % time expended

1. This KPI measures project throughput: ability to place work at the same rate that project time is being expended
2. For example:
  - If the project expenditures (construction) are 50% and the time (duration) is 50% complete then the ratio is 1.0 ( $50\%/50\% = 1.0$ ). This is the “balanced” state where work is placed at the same rate as time is expended
  - If the project expenditures (construction) are 75% and the time (duration) is 50% then the ratio is 1.5 ( $75\%/50\%$ ). This means that work in place is being accomplished at a rate higher than time. This could be a good condition (work is being done quickly) or a bad condition (accelerated billings).
  - Conversely if project expenditures are 50% and the time (duration) is 75% then the ratio is 0.67 ( $50\%/75\%$ ). This means that work in place is not keeping pace at a pace fast enough to meet project completion.

# How to Use Key Performance Indicators (KPI)

## Example: % \$ expended (work in place) / % time expended



**END**