Planning Associates 2012 Practicum:
The Economics of Planning:
Making Good Decisions with Less Information

Team 1.5

Idris Dobbs

September 17, 2012

HQ USACE,

Washington, DC

BLUF

- If the decision can be made qualitatively, the decision should be made qualitatively
- When quantitative analysis is needed to make the decision, it should be based on available information
- Use additional information only if it could change the decision

Problems & Opportunities

- **Problem** – The planning process has become costly time consuming, and model driven. The answers provided give the pretense of certainty

- **Opportunities** – Reduce the time and expense of making planning decisions. Incorporate risk and uncertainty in the answers. Use of models as tools that add value to the planning process

Guiding Principles

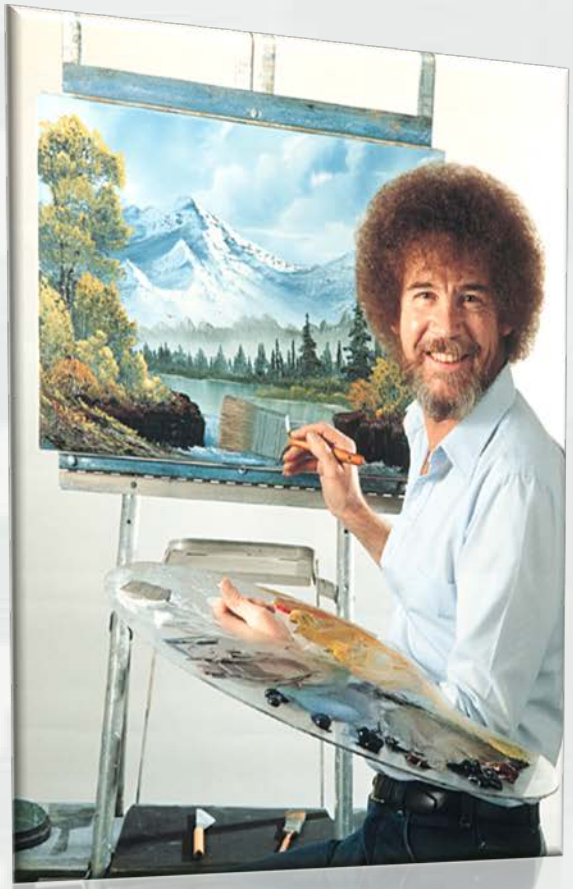
- Wisdom is a decision maker's greatest asset
- A reasonable assumption is better to come by than a precise detail.
- With regard to a USACE planning effort, wisdom is gained through the following:
  - Review of similar studies
  - Consultations with: Vertical Team, Subject Matter Experts, Sponsors/Locals
  - Experience clarifying the decision situation using only available information

Purpose

To propose generalized guidelines for minimizing the amount of additional information needed to make decisions. The approach includes the following steps:

- **Step-1**: Try to reach the TSP Milestone by making as many decisions as possible using qualitative means and available information.
- **Step-2**: When quantitative methods are needed to make the decision, base the quantitative analysis on existing/ readily available information only. Document the risks of doing so.
- **Step-3**: Once it can be shown that more information could affect the alternative selected, acquire additional information until more information no longer affects the decision.

Good Decisions & Level of Detail



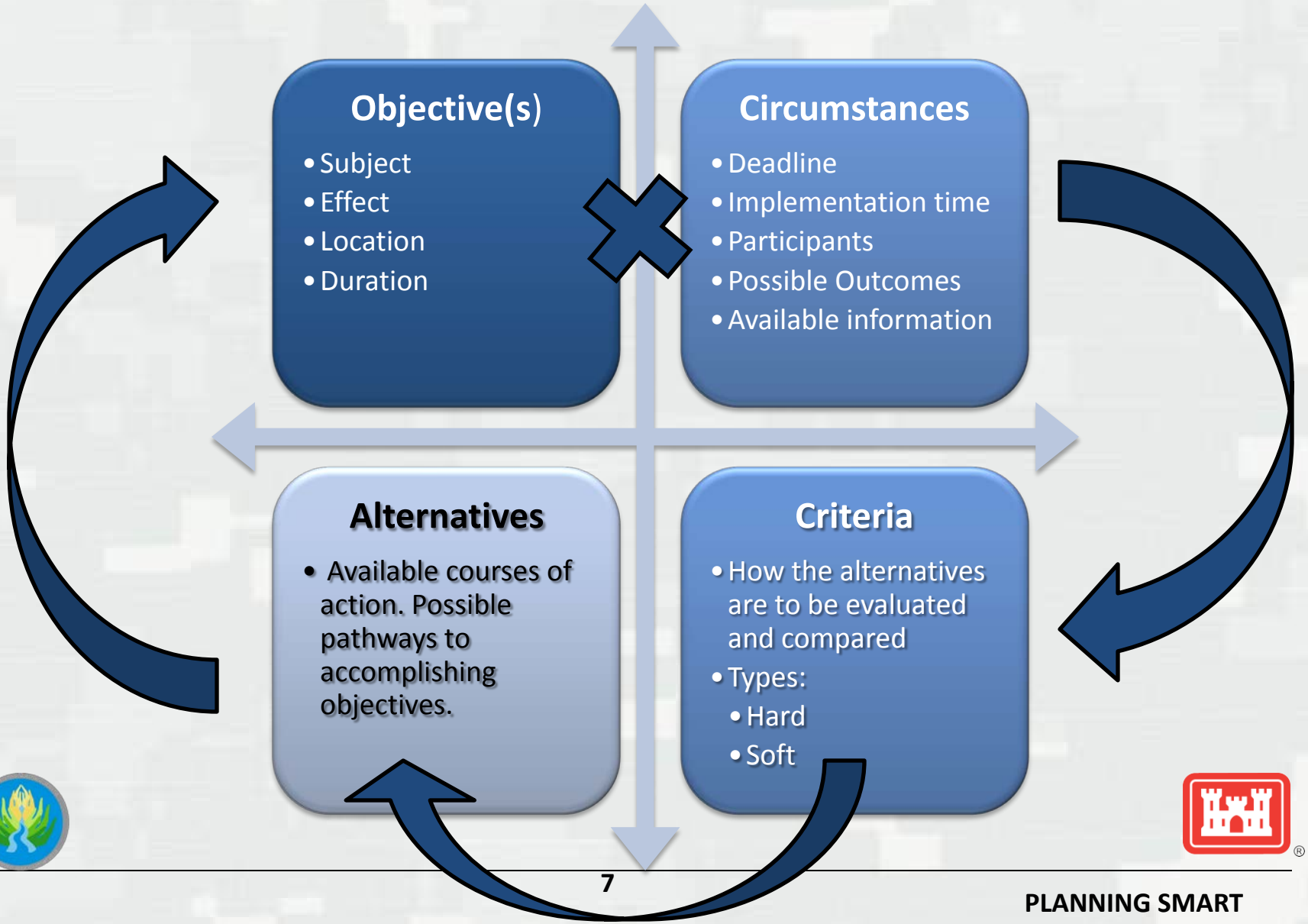
Bob Ross – Host of
"The Joy of Painting"

- Planning Study: Develop a picture of the future
- Once the picture is clear enough, make a decision
- How clear does "clear enough" need to be?

A Good Decision is…

- A good decision is a wise decision
- Wise decisions require wisdom
- This implies a disciplined approach to accumulating an understanding of the relationships among the principles relevant to the situation
- A good decision is based on the right level of detail at the right time

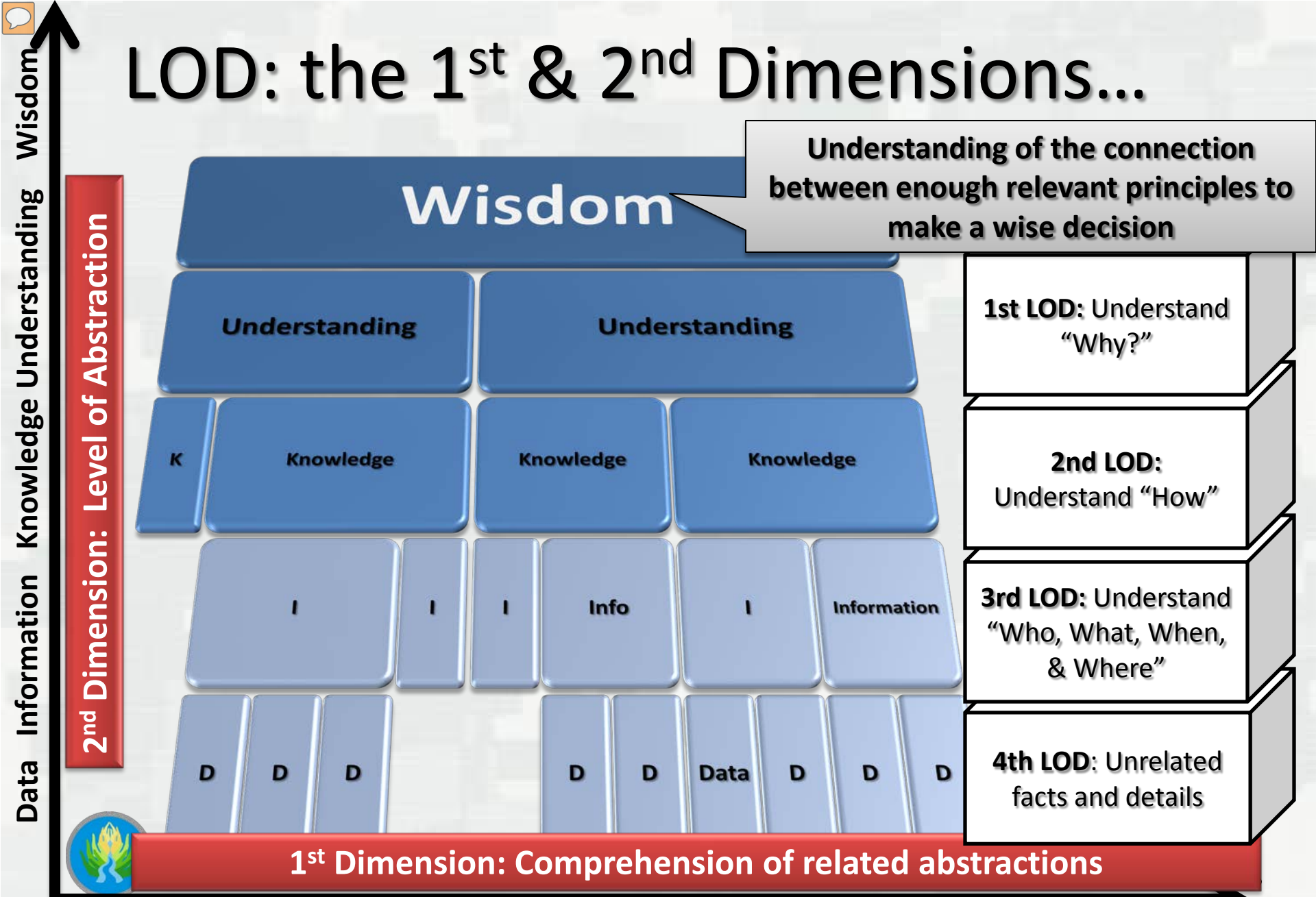
Components of a Decision



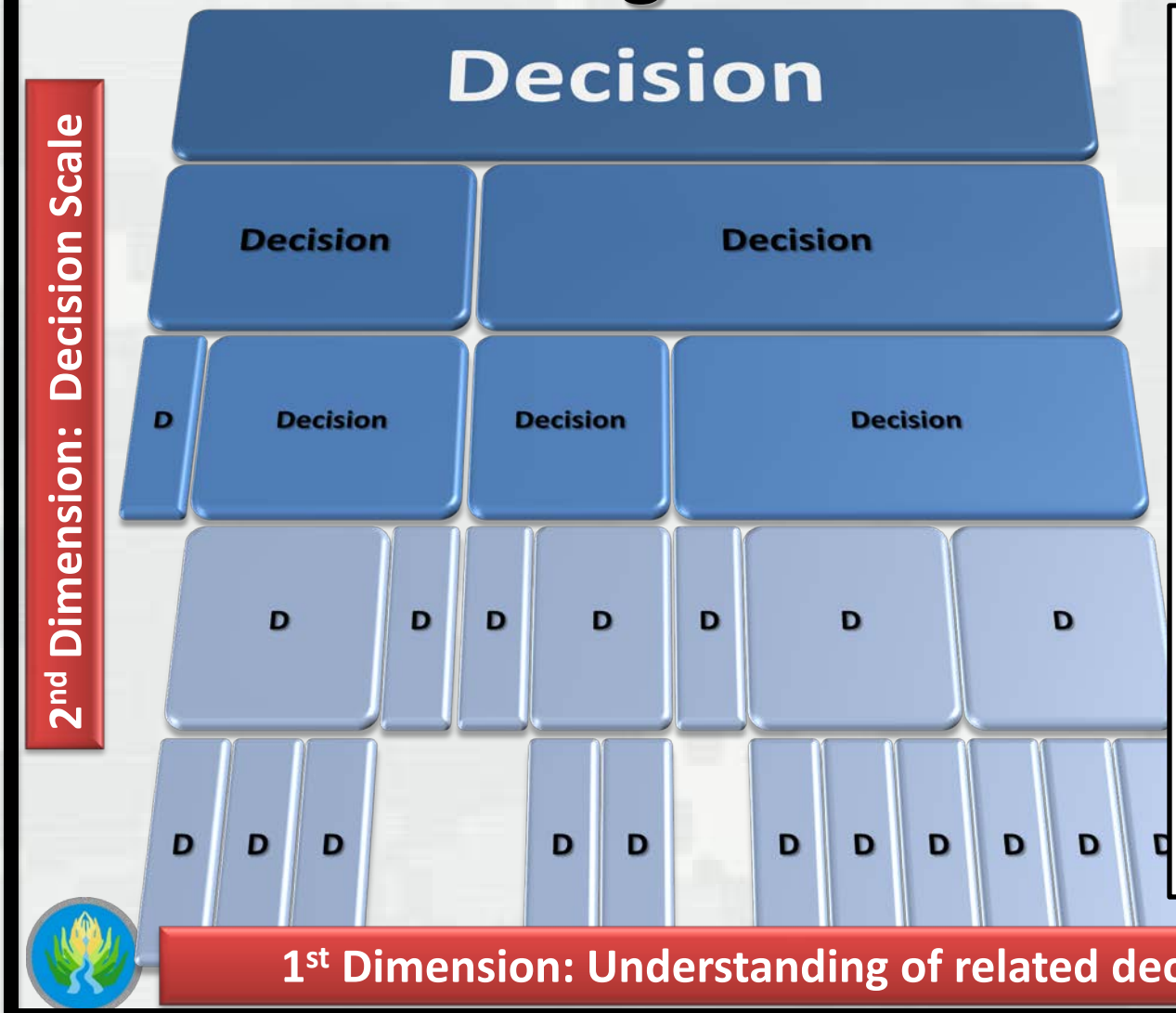
Level of Detail (LOD)

- **LOD:** A level of ordered, interrelated information used to describe something
- Consists of 3 dimensions (for explanatory purposes)
  - **1st Dimension**: understanding of interrelated information
  - **2nd Dimension**: level of abstraction of interrelated information
  - **3rd Dimension**: when level of interrelated information is needed
- In the context of planning and decision making, the LOD addresses the ordered, interrelated information needed to describe a situation so a decision can be made at a point in time

LOD: the 1st & 2nd Dimensions…



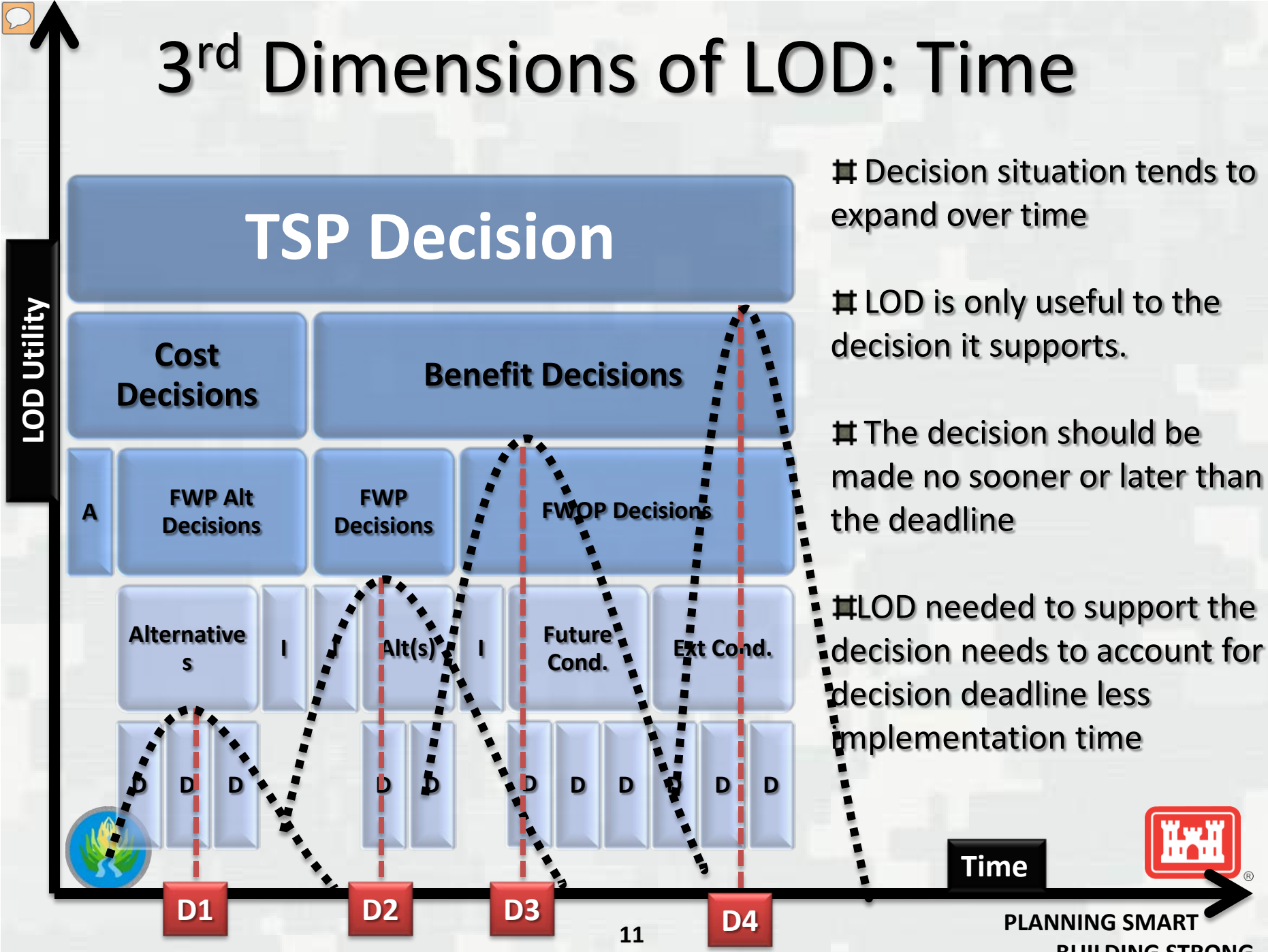
LOD Scaling = smaller decisions within larger decisions



Take-Away

- Larger decisions often encompass multiple smaller scale decisions
- Each smaller scale decision is an additional level of detail
- Each additional increment of LOD is less useful than the preceding increment
- a larger # of decision factors reduces the significance of each factor

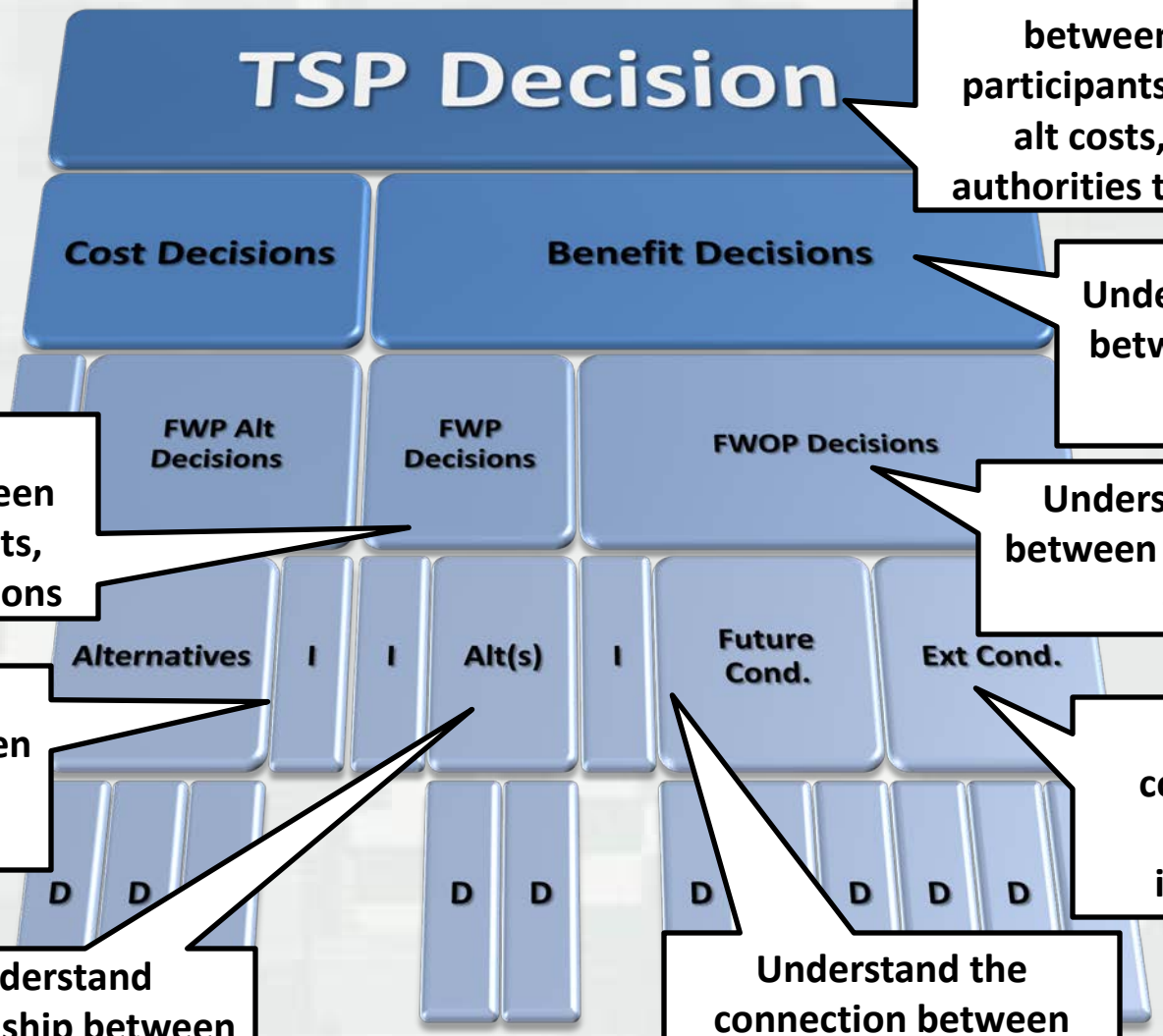
3rd Dimensions of LOD: Time



- Decision situation tends to expand over time
- LOD is only useful to the decision it supports.
- The decision should be made no sooner or later than the deadline
- LOD needed to support the decision needs to account for decision deadline less implementation time

PLANNING SMART
BUILDING STRONG®

Understanding the connection…



Understand relationship between objectives, participants, alt benefits, & alt costs, guidance, & authorities to make decision

Understand relationship between FWP & FWOP condition

Understand relationship between existing and future conditions

Understand the connection among relevant study inventory details

Understand the connection between study inventory details, & future conditions

Understand relationship between alternatives, and the objectives

Understand relationship between alternative outputs, and future conditions

Understand relationship between alternatives, and opportunity cost

Implications….

- Higher levels of abstraction are qualitative in nature and tend to be more useful for decision making
- Best to advance the decision situation as much as possible qualitatively, before using quantitative methods
- When greater levels of detail are needed, the decision situation needs to be quantified but greater precision is of limited value
- The value added from an additional level of detail increases sharply before a decision deadline, and plummets shortly after
- **The relationship between the detail and the criteria is more important than the detail itself.**

MINIMIZING THE INFORMATION NEEDED TO MAKE GOOD DECISIONS

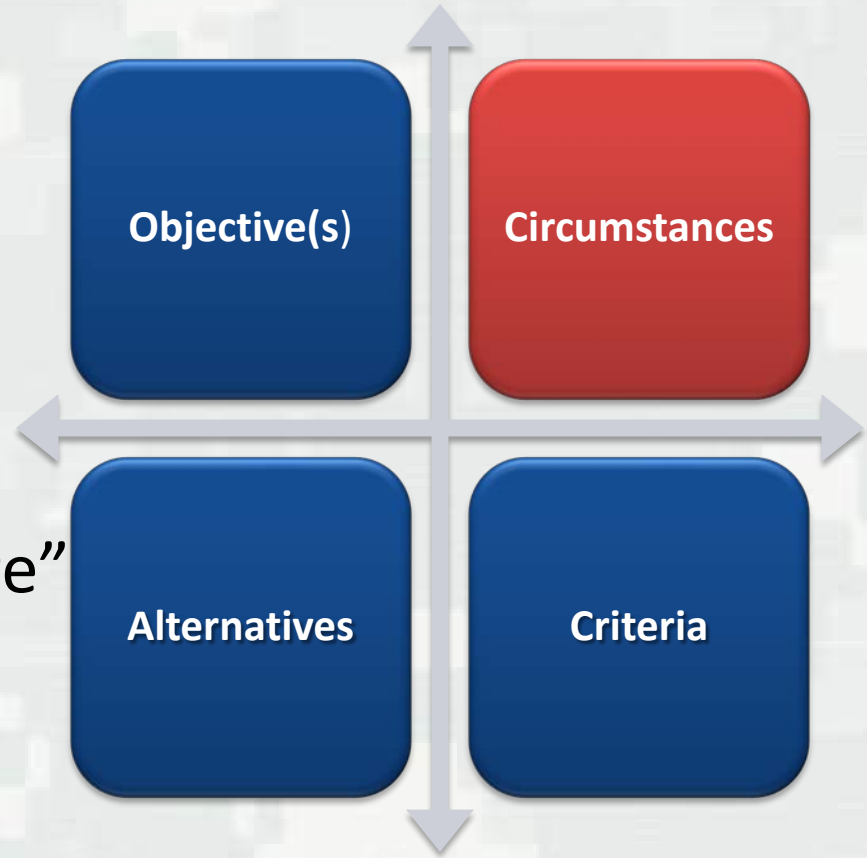
- Frame the decision situation in qualitative then quantitative terms
- Identify and evaluate the risks and uncertainties
- Make the decision, or get the minimum information to do so

Frame the Decision-I

- **Identify the decision and objective**
  - Subject
  - Effect
  - Location
  - Duration

Frame the Decision-II

- **Establish the decision circumstances**
  - Deadline
  - Implementation Time
  - Participants
  - Relevant "States of Nature"
  - Assumptions
  - Available Information
  - Outcome Possibilities



Frame the Decision-III

- **Establish the decision criteria**
  - How will the decision be made
  - Methods
  - Information Sources
  - Risk Tolerance??

PLANNING SMART
BUILDING STRONG®

Frame the Decision-IV

- **Alternatives**
  - Reduce array of alternatives qualitatively 1st.
  - When decision situation can no longer be clarified enough qualitatively, quantitative measurement must be used
  - Using established criteria, represent each alternative's net outcome as a distribution

Identify the Risks and Uncertainties

Type 1 Risk: The risk of making the decision based on an erroneous evaluation the alternative outcomes

- Assumptions
- Methods
- Data gaps/ inaccuracies
- More precision?

Identify the Risks and Uncertainties

Type 2 Risk: The risk that some other factor will impede, and/or prevent the decision from being made provided the alternative outcomes has been evaluated correctly and a TSP has been chosen.

- Identify the stakeholders that would oppose the decision and the reason for their opposition.
- Is it possible to address the stakeholders concerns?
- Will addressing the stakeholder concern change the decision?
- What is the best that can happen from addressing the stakeholders concerns? What is the worst that can happen from not addressing the stakeholders concerns?

Make the decision or get more info….

Addressing Type 1 Risk

- Is there something about the results that just doesn't seem right?
- What is the likelihood of a positive or negative outcome for each alternative?
- What is the expected value of a gain relative to the expected value of a loss for each alternative?
- Characterize the uncertainty for each alternative: Can it be reduced?

Ensure that the results are sensible before proceeding forward

If the uncertainty could be reduced, would doing so change the decision?

Make the decision or get more info….

Addressing Type 2 Risk

- Is there certainty of a TSP with a positive outcome?
- Will the Type 2 Risk prevent or change the decision if left unaddressed?
- If the risk can be mitigated, what is the cost of doing so?

If the likelihood of any alternative generating a positive outcome is low, there is no reason to address the type 2 risk

The risk should be addressed if doing so could alter the decision

If it is a risk that must be addressed but doing so will not affect the decision, then it is an implementation task, rather than a planning consideration.

Example from a HSDR Project:

Would Less Uncertainty Change This Outcome?

Expected Value of Three Sea Level Rise Scenarios Applied to Dune Alternative

Likelihood of a Positive /Negative Outcome

- P(+ Outcome)= .65
- P(- Outcome) = .35

Gain Relative to Loss

- EV = $10.6M
- Gain EV= $13.6 M
- Loss EV= $-3.0 M

Uncertainty = High

- SD = $18.8 M
- Conf = $2.1 M

Outcome Value Distribution	Dune EV	Dune+30 EV
-$38,200,000	0	6
-$26,600,000	0	3
-$21,800,000	0	3
-$17,000,000	7	6
-$12,200,000	3	17
-$7,400,000	6	6
-$2,600,000	10	14
$2,200,000	10	7
$7,000,000	12	6
$11,800,000	11	8
$16,600,000	7	2
$21,400,000	5	5
$26,200,000	7	8
$31,000,000	3	2
$35,800,000	6	4
$40,600,000	6	2
$45,400,000	4	1
$50,200,000	1	0
$55,000,000	2	0
$59,800,000	0	0
$69,900,000	0	0

Expected Value of Three Sea Level Rise Scenarios Applied to Dune+30 Alternative

Likelihood of a Positive /Negative Outcome

- P(+ Outcome)= .41
- P(- Outcome) = .59

Gain Relative to Loss

- EV = -$1.2 M
- Gain EV= $7.2 M
- Loss EV= $-8.4 M

Uncertainty = High

- SD = $18.8 M
- Conf = $2.1 M

Conclusion:

- If the decision can be made qualitatively, the decision should be made qualitatively.
- When quantitative analysis is needed to make the decision, it should be based on available information
- Use additional information only if it could change the decision

Questions & Discussion