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An Update on Target Value Design

Glenn Ballard
Design Forum
June 18-19, 2009
St. Louis, MO
Outline

• Where did Target Value Design (TVD) come from?

• What’s been done with what results to date?
  – Cases
    • Tostrud Fieldhouse Project (2002)
    • ARC Project (2005)
    • Shawano Clinic (2006)
    • Fairfield MOB (2007)
    • Cathedral Hill Hospital (current)
    • CPMC MOB (current)
  – P2SL Target Value Design Process Benchmarks
    • November, 2005
    • June, 2009

• What is TVD, really? How explain its results?

• What’s to come?
Target Value Design...

...is an adaptation of target costing, a method used in product development to manage product profitability.

The key idea is to set a target cost (what you are willing to spend to design, produce and sell a product) based on expected revenues and desired profit margin [Price-Profit=Cost versus Price-Cost=Profit].

Toyota is one among many Japanese manufacturers who have perfected this method in their product development system. [Key texts are by Cooper & Slagmulder, 1997 & 1999]
Target Value Design...

...has had some anticipations in construction:

• the U.S. Dept. of Defense’s ‘Designing to Cost’ process from the 1980’s. This was an attempt to steer design to cost targets, but did not ground those targets in the business case of buyers nor use positive incentives to align the interests of producers.


• Haahtela’s TaKu method and steering design, reported by Pennanen in 2003.

• Kristoffersen, et al’s experimentation with value workshops—1st reported in 2004.
Two outcomes of TVD that look to be repeatable (at least within the healthcare and education sectors)

1. Projects are completed below market cost—so far as much as 19% below.

2. Expected cost falls as design develops.
Project Phases and Target Value Design

Preproject Planning

Project Definition
* Business Planning
* Plan Validation

Set Targets

Design
* Develop Design
* Detailed Engineering

Design to Targets

Permit

Go/No Go

Go

Commission/Turnover

Go/No Go

Go

Build to Targets
St. Olaf’s Fieldhouse Project
<table>
<thead>
<tr>
<th></th>
<th>St. Olaf College Fieldhouse</th>
<th>Carleton College Recreation Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completion Date</td>
<td>August 2002</td>
<td>April 2000</td>
</tr>
<tr>
<td>Project Duration</td>
<td>14 months</td>
<td>24 months</td>
</tr>
<tr>
<td>Gross Square Feet</td>
<td>114,000</td>
<td>85,414</td>
</tr>
<tr>
<td>Total Cost (incl. A/E &amp; CM fees)</td>
<td>$11,716,836</td>
<td>$13,533,179</td>
</tr>
<tr>
<td>Cost per square foot</td>
<td>$102.79</td>
<td>$158.44</td>
</tr>
</tbody>
</table>
Sutter Old Process

Business Planning

Engage FPD

Board Approval

No

Feasibility

SD’s DD’s CDs

No

Board Approval

Permit

Construction
Target Value Design Process Flow

FPD & Business Planning → Feasibility Study → Board Approval

No

SD’s & DD’s → CD’s → Permit → Construct

Set Target Detailed Scope & Budget

Owner
Arch
CM/GC
Estimating Consultant

Fewer Back Checks → Expected Predictable Time & Cost

Increased Value & Less Stress

Construct
What Have We Learned?

- **Establish A Baseline**
  Do a Feasibility Study integrated with a detailed budget preparation. The results of the study provide the basis of understanding of the scope and budget of the project.

- **Change the Traditional Relationships**
  Include everyone who will impact the project at the start of the project, and build those relationships!
  (Collaborate .........Really Collaborate!)
Tools

- Feasibility Study With Detailed Budget (Target)
- Engage all parties at earliest possible time
- Scheduling (At ARC the end users were divided into clear groups for SD’s and beyond)
- Use a room data sheet
- Full engagement from the Affiliate
- Estimating at the design table
- Empowerment to declare a breakdown
- Clear conditions of satisfaction to teams
- Willingness to say no (need to have or want to have)
- Target team matrix
Results

• ED project - 3 Fundings
• Bed Tower - 4 Fundings
• ARC - 1 Funding
  On Time
  50% CD’s w/ 16% Cont.
  [ultimately completed on budget, but with some space shelled]
Changes Needed from Current Practice (11/2005)

- Clients spend more time and money in the project definition phase of projects than they traditionally have done.
- The major players on the project delivery team are not selected through competitive bidding but rather through value based proposals.
- Architects relinquish their exclusive access to clients.
- Design professionals embrace true collaboration with facility users, suppliers and builders – collectively exploring problems and jointly developing solutions.
Changes Needed-continued (11/2005)

• Suppliers and builders understand and respect designers and learn how to contribute and participate in project definition and design processes.

• Design solutions are developed with cost, schedule, and constructability as design criteria.

• Designers' work is restructured based upon completing smaller batches of design documents and releasing work to other members of the team.

• General contractors allow and encourage specialty contractors to have an equal seat at the table.

• The incentives of all team members are aligned with pursuit of project objectives.
Selected Research Questions/Issues (11/2005)

1. Hypothesis: Implementation of Target Value Design will reduce variability of work flow, and reduce the uncertainty of project ends and means.

2. Hypothesis: The contingency needed to absorb variability and uncertainty will decline as variability is reduced.

3. How best to assure that the use of the facility is explored and agreed upon before attempting to design the facility itself?

4. Is the alignment of incentives through forms of relational contracting measurably effective in generating increased value and eliminating more waste than when incentives are not aligned?
5. Does the investment in upstream processes pay off in a) the avoided costs of bad projects that are not allowed to continue, b) in the increase in value from more effective processes for articulating values and controlling design and construction to the delivery of those values, c) in the reduction in waste from incomplete and inaccurate drawings, from duplicated efforts, from rework, d) from more reliable delivery to quality, time and cost expectations, e) from the ability to respond more quickly to changes and discoveries?
Brief Update on Developments since the 2005 Benchmark

1. More data points showing that TVD projects are delivered below market cost and that cost estimates decrease over time; e.g., Sutter Fairfield MOB, healthcare projects in the Midwest, K-12 projects in California.

2. Shift of attention to business planning and determination of allowable cost. Understood the need to design how facilities will be used before designing facilities.

3. Joint owner/team business planning: Cathedral Hill MOB.

4. More experience/experiments with aligning interests (Fairfield was the first IFOA project).
Brief Update on Developments since the 2005 Benchmark

5. Model-based estimating
6. Big room (Camino MOB); co-located teams
7. Integration of TVD and set-based design.
8. Use of A3 format for proposals.
9. Use of Choosing by Advantages method for choosing between alternatives.
The Boldt Company
37359 ThedaCare Shawano Ambulatory Surgery Clinic
Project Final Costs Comparison
Thursday, November 2, 2006

Chart Area
- Contingencies
- Owner Directed Changes
- Design Costs
- Construction Costs

- Business Case Board Approval
- Benchmark Based on Market
- Contingency Redistribution
- Design Completion
- Open for Patients!

- $13,100,000 Target Cost
- $189,187 Contingencies
- $167,896 Owner Changes
- $729,620 Design Cost
- $12,033,532 Construction
The target cost (construction budget) was set 3.6% below market, the actual cost was 14.6% below target, and 17.6% below the benchmark. Most of the released funds were used to provide value-adding scope, especially for imaging capability, with the remainder returned to the client.

Completed 3.5 months ahead of schedule – 70 additional days of clinic revenue translating into nearly $1 mil. in the expanded imaging service line functions and additional revenue in the 2006 year.
The project was completed in 25 months, despite a 3 month delayed construction start, i.e., construction duration was reduced from 25 to 22 months.

The target cost ($18.9 million) was set 14.1% below the benchmark ($22.0 million). The actual cost ($17.9 million) for the original scope underran the target by 5.3% and underran the benchmark by 18.6%.
Cathedral Hill Hospital Project: Expected, Allowable & Target Cost
Cathedral Hill Hospital Project:  
Market, Allowable, Expected & Target Cost 

[Graph showing cost over time with various cost scenarios and labels for Market cost with inflation and Allowable cost for construction.]
Cathedral Hill Hospital Project: Changes in Expected Cost
<table>
<thead>
<tr>
<th></th>
<th>Performance</th>
<th>Focus</th>
<th>Innovations</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>St. Olaf’s</strong></td>
<td>10 months faster &amp; 2/3 $/sf compared to Carleton</td>
<td>Designing to target cost</td>
<td>Proactive value engineering, target cost teams by building system</td>
<td></td>
</tr>
<tr>
<td><strong>Acute Rehabilitation Center</strong></td>
<td>near target in period of high cost escalation</td>
<td>Designing to target cost</td>
<td>Business plan validation</td>
<td>Provoked Sutter Health to commit to TVD</td>
</tr>
<tr>
<td><strong>Shawano Outpatient Surgery Center</strong></td>
<td>3.5 months early, 18% under market</td>
<td>Setting and Designing to target cost</td>
<td>More rigorous determination of target cost</td>
<td></td>
</tr>
<tr>
<td><strong>Fairfield MOB</strong></td>
<td>19% under market</td>
<td>Setting and Designing to target cost</td>
<td>Key subcontractors involved in plan validation</td>
<td>Owner did not set an allowable cost</td>
</tr>
<tr>
<td><strong>Cathedral Hill</strong></td>
<td>Now $6 million below allowable cost, which was set 13% below market. Target cost recently set $70 million below allowable, with gainsharing provisions.</td>
<td>Setting and Designing to target cost</td>
<td>Allowable cost, rapid estimating and weekly budget reconciliation, co-located during validation and design, value-adds incorporated into design in anticipation of cost savings</td>
<td></td>
</tr>
<tr>
<td><strong>CPMC MOB</strong></td>
<td>NA</td>
<td>Business planning, setting targets, designing to targets</td>
<td>Project team and owner co-created project business plan</td>
<td></td>
</tr>
</tbody>
</table>
P2SL 6/2009 TVD benchmark

- Targets are set as stretch goals to spur innovation.
- Target cost and scope are allocated to cross-functional TVD teams, typically by facility system; e.g., structural, MEP, interiors, exterior.... (an oversight in 2005).
- TVD teams update their cost estimates frequently—usually every 3 weeks during design development.
- The project cost estimate is frequently updated (often weekly) to reflect TVD team updates (could be a plus/minus report), and reviewed in a weekly meeting of TVD team coordinators and discipline leads, but open to all project team members.
P2SL 6/2009 TVD benchmark

- The cost and quality implications of design alternatives are discussed prior to major investments of design time.
- Design is managed with a set based strategy, so that all time and resources available within project constraints are used to test and develop alternatives.
What is Target Value Design really? Why does it work so well?

- TVD is a management practice that drives design to deliver customer values within project constraints.
- TVD is an application of Engineer Ohno’s advice to “lower the river to see the rocks”; i.e., to self-impose necessity as a means to innovation and continuous improvement
Chief Engineer Suzuki’s YETs

- Great high-speed handling/stability
- Fast and smooth ride
- Super quiet
- Elegant styling
- Warm
- Great stability at high speed

- A pleasant ride
- Low fuel consumption
- Light weight
- Great aerodynamics
- Functional interior
- Low aerodynamic friction
Target Value Design:

...rests on a production management foundation and treats cost as an outcome of production system design, operation and improvement.

For those who only buy and do not produce (design or make), cost is driven by market pricing and cleverness in deal making. But buying for less is not the only available strategy. Actual cost is a function not only of what you pay but also of how you use what you buy. Design of product and process can change the type of materials required and their quantities, and can improve the productivity of design and construction professionals.
Why does the expected cost fall as design develops?

- Scope control – steering design to targets
- Scope refinement/Buildability/Contingency reduction – involvement of specialists in designing
- Proactive value engineering
Why Change a Winning Game?

To enable better investment of cost savings.

On the case study projects, cost savings were assured late in the project, when investment opportunities had shrunk. How can we make investments when the lever arm is longer?
Relative Costs

Healthcare outcomes
- Clinical outcomes
- Hospital-acquired infection rates
- Safety outcomes
- Medication error rates
- Medication rates
- Re-hospitalisation rates
- Length of stays
- Patient transfers
- Costs per unit of service
- Patient satisfaction
- Visitor satisfaction
- Staff morale
- Staff turnover
What Changes?

- Give the design team a tool to calculate the impact of design alternatives on facility life cycle costs and benefits.
- Keep the budget alive during design, recalculating the allowable and target cost based on the anticipated impact of design alternatives on life cycle costs and benefits.
Challenges

1. Persuade clients to develop an operations cost model and use it to calculate their return on investment, and hence what they are willing to invest to get that return.

2. Persuade clients to give the operations cost model to the design team.

3. Learn how to link the product and operations models so changes in the former are reflected in the latter.

4. Persuade financiers to allow a floating budget during design.

5. Learn how to design to a moving target.
Prospects for moving forward

• Cal Berkeley has initiated international collaboration on TVD research: Haahtela (Finland), Loughborough U. (U.K.), Niras & the Danish Technical U. (Denmark)

• Research proposals have been submitted to the U.S. Dept. of Energy and to the California Energy Commission on improving investment in the energy efficiency of buildings. Partners include the Fisher School of Real Estate at Cal Berkeley’s Business School and the Lawrence Berkeley National Laboratory.
What are your takeaways?
What questions have been provoked?
Number of ED Arrivals By Time of Day

[Graph showing the number of patients arriving at the ED by time of day, with separate lines for walk-in and EMS cases.]
Impact of Inpatient Discharge Time of Day on ED Length of Stay

![Impact of Inpatient Discharge Time of Day on ED Length of Stay](image)

Area of Opportunity

ED Avg LOS (Hours)

Inpatient Discharge Time of Day

Baseline  3pm  2pm  1pm  noon  11am
Identifying a Facility “Break Point”

How many visits to the Emergency Department can our facility handle as designed with 32 ED Beds and 370 IP Beds?
Target Value Design

• Integrated team validates facility can be built for available funds
• Sets target cost at or below allowable cost
• Owner, architect and contractors work within market constraints (allowable cost)

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LCI Design Forum

The “Quarterback Rating” for Projects
A Unique Analysis of Project Performance

St. Louis, Missouri
June 13, 2008
# How Does it Work?

- **Site Factor**
  - A) Unlimited Access: 1.000
  - B) Limited Access: 1.067
  - C) Restricted Access: 1.133
  - D) Severely Restricted: 1.200

- **Interior Finishes**
  - A) Economy: 0.975
  - B) Standard: 1.000
  - C) High: 1.025
  - D) Premium: 1.050

- **OSHPD Construction Type**
  - A) N/A: 1.000
  - B) MOB: 0.925
  - C) Hospital: 1.400

- **Schedule Impact**
  - Accelerated: 1.025
  - None: 1.000

- **MEP Systems**
  - A) Economy: 0.950
  - B) Standard: 1.000
  - C) High: 1.050
  - D) Premium: 1.100

- **Taxable?**
  - No: NA
  - Yes: NA

- **New / Renovation**
  - A) Minor Renovation: 0.50
  - B) Major Renovation: 1.00
  - C) New Construction: 1.00

- **Building Type**
  - A) Wood Framed: 0.850
  - B) B Occupancy: 0.900
  - C) 2 Hour Structure: 1.000
  - D) High-Rise Construc: 1.100

- **MEP Services**
  - A) None Required: 1.000
  - B) Chilled or Hot Water: 1.025
  - C) Chilled & Hot Water: 1.050

- **Building Envelope**
  - A) Economy: 0.950
  - B) Standard: 1.000
  - C) High: 1.050
  - D) Premium: 1.100
  - E) High Eff Premium: 1.150

- **Seismic Zone**
  - A) Low: 1.000
  - B) Moderate Low: 1.125
  - C) Moderate High: 1.250
  - D) High: 1.375
  - E) Very High: 1.500
Expected cost of functional components.

Waiting for design solutions for counting luminaires and switchboards would last months, whereas feedback to the customer must be given in days. We do not know future design solutions, but we know some “design customs” because of the past design solutions; for 400 lux illuminance in a space we need lamps, cables, switchboards etc. Number of luminaries needed is

\[ N = \frac{E \times A}{(F \times n \times U_f \times M_f)} \]

where
- \( E \) is illuminance required
- \( A \) is size of the space
- \( F \) is efficiency of the lamp
- \( n \) is number of lamps in the luminaire
- \( U_f \) is a certain factor (dealing with the absorption of surfaces)
- \( M_f \) is a factor (dealing with probability that lamps work)

It is not necessary to design first a design solution to count out the number of luminaries (or size of main switchboard, or...) as the designers use the same formula to determine the number of luminaries, if we know client requirements (assembly hall 1200 m², 600 lux). Cost then can be based on component level market data. Luminaries can be priced by unit prices of luminaries sold in the market.

Taku™ – product model models all the components of a building basing on requirements the customer sets on the spaces, on the building as part of urban environment and basing on the conditions in the site. The result is always “reference system” that exists in the market.
Business Planning

1. Assess the business case (demand, revenues), taking into account the cost to own and use the facility (business operations, facility operations, facility maintenance, adaptability, durability) as well as the cost to acquire it.

2. Determine minimum acceptable ROI or maximum available funds -- set the allowable cost for the facility.

3. Answer the question: If we had a facility with which we could achieve our specific purposes, and if we could have that facility within our constraints of cost, location and time, would we do it?

4. If the answer is positive, and if project delivery is not considered risky, fund the project. If the answer is positive and project delivery is considered risky, fund a feasibility study to answer the question: Can we have the facility we have in mind, will it enable us to achieve our purposes, and can we acquire it within our constraints?
Plan Validation/Feasibility

Kickoff Workshop: Review Ends, Means and Constraints specified in the Project Business Plan

User Group Mtgs

Values Workshop

Infrastructure Mtgs

Design Workshop

Constraints Workshop

Site Location Mtgs

Alignment Workshop

If team can align ends, means and constraints, and if any of these have been changed from the business plan, resubmit to Business Planning

If Business Planning agrees, submit recommendation to fund the project

Stage Gate 2

Set target cost below budget or increase value delivered for budget

Set the Target Cost

Design
Plan Validation/Feasibility

1. Select key members of the team that will deliver the project if judged feasible.
2. Determine stakeholder values.
3. Explore how the facility will perform in use through process modeling and simulation.
4. Describe the facility that will deliver the values.
5. Determine the expected cost if the facility were provided at current best practice.
6. If expected cost exceeds available funds or violates ROI, attack the gap with innovations in product/process design, restructure commercial relationships, etc.
7. If expected cost still exceeds available funds or violates ROI, adjust scope by sacrificing lesser ranking values.
8. If the scope and values that support the business case can be provided within financial constraints, fund the project. Otherwise, change the business plan or abandon the project.
Validated Business Plan

Set the target cost

Form cross functional teams by system and allocate project target cost

Kickoff Workshop: Review Ends, Means and Constraints specified in the Project Business Plan after Plan Validation

Design Development

User Group Mtgs  System Team Mtgs  Special Studies

TVD Workshop

User Group Mtgs  System Team Mtgs  Special Studies

TVD Workshop

Continue alternating meetings and TVD workshops as time allows and time is needed to develop, explore and select alternative product and process designs

Submit design for acceptance

Go/No Go
Design Development

• Set the target cost—typically lower than the budget that assumed current best practice
• Form Target Value Design teams by system and allocate the target cost to each team
• Hold a kickoff workshop
• Launch meeting schedule
• Use a set based approach, evaluating sets against target values
• Provide cost and constructability guidelines for design; e.g., product/process standardization
• Promote collaboration: have designers get cost input before developing design options
• Do rapid estimating; hold frequent budget alignment sessions
• Use value engineering proactively
• Hold design reviews with permitting agencies
<table>
<thead>
<tr>
<th></th>
<th>Purpose</th>
<th>Finance</th>
<th>Action</th>
<th>Example</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Developer</strong></td>
<td>Create something to sell to others</td>
<td>Maximum available funds or minimum</td>
<td>Target cost</td>
<td>Property developer</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>acceptable ROI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Producer</strong></td>
<td>Create means for producing products or</td>
<td>Maximum available funds or minimum</td>
<td>Target cost</td>
<td>Oil refiner, healthcare company, university</td>
<td>But note: If facilities are not commodities and can impact use benefits through different designs, then Shoppers are actually Producers, and buying at lowest price is not likely to deliver greatest value.</td>
</tr>
<tr>
<td></td>
<td>services</td>
<td>acceptable ROI</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Shopper</strong></td>
<td>Acquire commodities</td>
<td>Ability to afford</td>
<td>Buy at lowest</td>
<td>Law firm, insurance company</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>price</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Art Collector</strong></td>
<td>Create something without predefinable</td>
<td>Within initially indeterminate limits</td>
<td>Design, then</td>
<td>Municipal library, performing arts theater</td>
<td>At some point, maximum available funds will constrain the design. That point may occur earlier or later in the design process.</td>
</tr>
<tr>
<td></td>
<td>properties</td>
<td>limits, funds can be acquired based on</td>
<td>estimate cost, then acquire funds</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>the attractiveness of the design</td>
<td></td>
<td></td>
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</tbody>
</table>
“The hospital is a machine the design of which impedes or facilitates its fitness for use.”

Dave Chambers
Chief Architect
Sutter Health
The Current Prescription-Briefly

• Assumption: Project teams are responsible for helping customers learn what they want

• Process:
  – Customers: tell the team what you are able and willing to spend to get what you want—the allowable cost for the project.
  – Develop values from purposes and design criteria/specifications from values.
  – Design how the facility will be used before designing the facility.
  – Engage key members of the project delivery team to help validate and improve project business plans.
  – If expected cost exceeds allowable, redo the business plan or abandon the project.
  – Set target costs below expected as stretch goals to spur innovation.
  – Steer design toward targets using a set based approach in which alternatives are evaluated against values and decisions are made at the last responsible moment.
Research Questions/Issues (11/2005)

1. Can industry advisors play a useful role in client business planning?
2. How best to select project delivery teams; e.g., test for compatibility, engage self assembled teams?
3. How best size and manage contingency to achieve target costs?
4. Hypothesis: Implementation of Target Costing will reduce variability of work flow, and reduce the uncertainty of project ends and means.
5. Hypothesis: The contingency needed to absorb variability will decline as variability is reduced.
Research Questions/I Issues (11/2005)

6. How to improve on current benchmarks as regards the integration of cost modeling and designing?

7. What information technologies can be used to support Target Costing practices; e.g., integrating product, process and cost models?

8. How best to assure that the use of the facility is explored and agreed upon before attempting to design the facility itself?

9. Involving downstream players in upstream processes produces more detailed design earlier than in the past. Now that the level of detail and accuracy achieved in feasibility is equivalent to that previously achieved at the end of schematic design or even into design development, are those traditional phases or phase names still appropriate, or do they cause confusion?
10. Does the investment in upstream processes pay off in a) the avoided costs of bad projects that are not allowed to continue, b) in the increase in value from more effective processes for articulating values and controlling design and construction to the delivery of those values, c) in the reduction in waste from incomplete and inaccurate drawings, from duplicated efforts, from rework, d) from more reliable delivery to quality, time and cost expectations, e) from the ability to respond more quickly to changes and discoveries?

11. Is co-location of project delivery team members beneficial and feasible?

12. How do we collaborate when team members cannot co-locate regularly?

13. Is an evergreen, ranked list of stakeholder values beneficial and feasible as a tool for value management?
14. Can the concept of accurately estimating future cost based on benchmark practice be effectively implemented?

15. Is the practice of setting a target cost below a current benchmark budget ("expected cost") in order to drive innovation beneficial and achievable?

16. Is the alignment of incentives through forms of relational contracting measurably effective in generating increased value and eliminating more waste than when incentives are not aligned?

17. How/can value engineering/value management tools and techniques be beneficially and practically applied in the Target Costing process?

18. Is it better for specialty contractors to be engaged on a design-assist or a design-build basis?
P2SL 6/2009 TVD benchmark

1. The client with the help of key service providers evaluates the business case and decides whether to fund a feasibility study.

2. The feasibility study involves all key members (designers, constructors, and client stakeholders) of the team that will deliver the project if the study findings are positive.

3. The client is an active and permanent member of the project delivery team.

4. The feasibility study produces a detailed budget aligned with scope.
P2SL 6/2009 TVD benchmark

5. All team members understand the business case and stakeholder values.

6. A cardinal rule is agreed upon by all performers – the Target Cost cannot be exceeded and the Target Program and Quality cannot be changed, except by the client.

7. Cost estimating and budgeting is done continuously through intimate collaboration between owner, design professionals and cost modelers (all team members)—‘over the shoulder estimating’.
P2SL 6/2009 TVD benchmark

8. The Last Planner system is used to coordinate the actions of team members.
9. Targets are set as stretch goals to spur innovation.
10. Target cost and scope are allocated to cross-functional TVD teams, typically by facility system; e.g., structural, MEP, interiors, exterior....
11. TVD teams update their cost estimates frequently—usually every 3 weeks during design development.
12. The project cost estimate is frequently updated (often weekly) to reflect TVD team updates (could be a plus/minus report), and reviewed in a weekly meeting of TVD team coordinators and discipline leads, but open to all project team members.
13. The cost and quality implications of design alternatives are discussed prior to major investments of design time.

14. Design is managed with a set based strategy, so that all time and resources available within project constraints are used to test and develop alternatives.
Research Questions/Issues for going beyond the 6/2009 Process Benchmark

1. Refine methods and verify the benefits of using A3 proposals and Choosing by Advantages.

2. How to sort out stakeholder value earlier and better?

3. What training to provide?

4. How best facilitate needed behavior through relational contracting—aligned incentives...., leadership?
Research Questions/I Issues for going beyond the 6/2009 Process Benchmark

6. Find out how to do TVD on projects without relational contracts such as IFOA, where interests are not fully aligned; e.g., public sector projects.

7. Understand when an owner should shift cost risk (e.g., through a GMP) and when not.

8. Find out how to apply/adapt TVD to different types of products (e.g., infrastructure) and different types of owners (e.g., developers).

9. Describe experience and data on aligning interests/incentives throughout the life of a project.
Research Questions/Issues for going beyond the 6/2009 Process Benchmark

10. Can we figure out how to better do benchmarking against market?

11. Scheduling/cost interdependency.

12. Work structuring/TVD connection

13. Confirm the widely held opinion that projects delivered traditionally typically experience an increase in cost estimate with increasing design detail and overrun their budgets.

14. Explain why TVD projects do the opposite; namely, cost estimates decrease over time and projects are delivered on or under budget.
Reduce variation

- Lower the river to reveal the rocks
- Match buffers to actual variation
Overview

• Assumption: Project teams are responsible for helping customers learn what they want

• Process:
  – Develop values from purposes and design criteria from values
  – Design how the facility will be used before designing the facility
  – Engage key members of the project delivery team to help validate and improve project business plans
  – Customers: tell the team what you are able and willing to spend to get what you want
  – Set targets as stretch goals to spur innovation
  – Steer design toward targets using a set based approach in which alternatives are evaluated against values and decisions are made at the last responsible moment
Research Questions/Issues for going beyond the 6/2009 Process Benchmark

5. TVD projects release funds for investment in value-adding features of facilities, but the availability of these cost underrun-based funds is determined late in projects, reducing the potential return on investment. CHH embedded some value-adding changes in the facility design in anticipation of cost underruns, but that is obviously a partial and limited solution.

Hence this proposal for a Life Cycle TVD:

– Learn how to derive an allowable cost from a facility operations cost model, together with the ability to finance investment.

– Give that allowable cost and model to the project team so they can recalculate the allowable cost based on expected impact of design alternatives on life cycle costs and benefits, again within the limits of ability to finance.

– Learn how to finance projects where the budget varies during design, and where life cycle investment decisions are made during design.
Target Value Design...

• ...strives to reduce the waste and rework in the Design/Estimate/Redesign cycle.
• ...requires a fundamental shift in thinking from 'expected costs' to 'target costs'.
• ...necessarily involves cross functional teams. No one person has all the knowledge.
• ...cries out for an integrated product/process /cost model.
P2SL TVD Process Benchmark
issued Nov 2005

1. The client evaluates the business case and decides whether to fund a feasibility study.

2. The feasibility study involves all key members (designers, constructors, and client stakeholders) of the team that will deliver the project if the study findings are positive.

3. The client is an active and permanent member of the project delivery team.

4. The feasibility study produces a detailed budget aligned with scope.
P2SL TVD Process Benchmark
issued Nov 2005

5. All team members understand the business case and stakeholder values.

6. A cardinal rule is agreed upon by all performers – the Target Cost cannot be exceeded and the Target Program and Quality cannot be changed, except by the client.

7. Cost estimating and budgeting is done continuously through intimate collaboration between owner, design professionals and cost modelers (all team members)—‘over the shoulder estimating’.

8. The Last Planner system is used to coordinate the actions of team members.