

An Update on Target Value Design

**Glenn Ballard
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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:

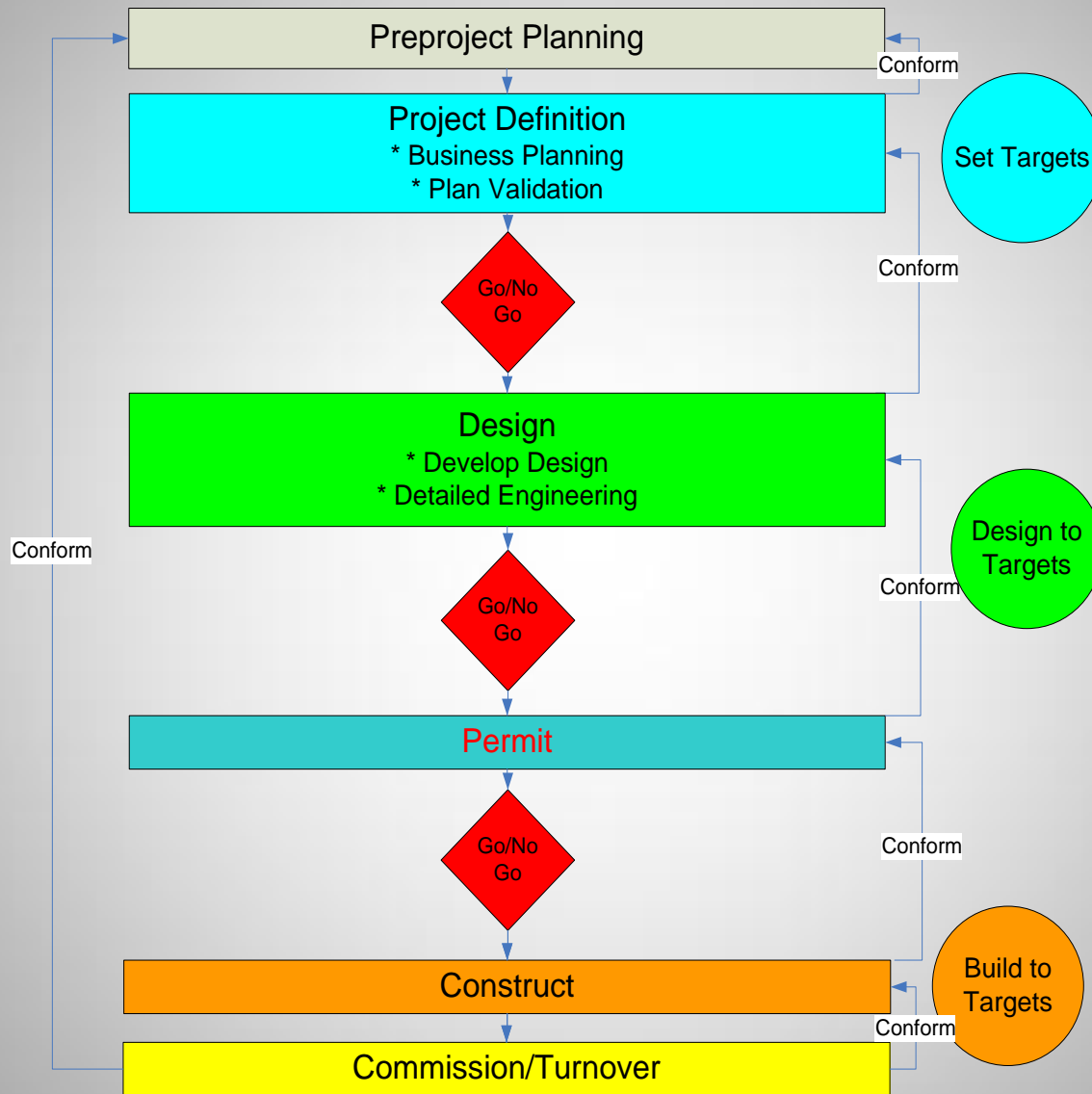
- the U.S. Dept. of Defense's 'Designing to Cost' process from the 1980's. This was an attempt to steer design to cost targets, but did not ground those targets in the business case of buyers nor use positive incentives to align the interests of producers.
- The U.K. Ministry of Defense experimented with target costing on a construction project. Unfortunately the experiment failed. Reported in 2000 by Nicolini, et al.
- 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.

1. Expected cost falls as design develops.

Project Phases and Target Value Design



St. Olaf's Fieldhouse Project



Glenn Ballard ©

Target Cost Model

Legend:

Const TOTAL per SF
89.33

D-B TOTAL per SF
94.12

Project: Fieldhouse Expansion
 Location: St. Olaf College Northfield MN
 Phase of Design: Schematic Target
 Date: June 21, 2001

Worth (Target)
Current Estimate

Construction
9,840,302

Owner Reserves
343,115

Escalation

Construction TOTAL
10,183,417

Design-Build TOTAL
10,729,883

NOTES:
 Bldg. Type: Recreational
 Target (SQFT): 114,000
 Floors: Single story plus mezzanines

Incl Design at \$504,886+41600

SITE WORK	BUILDING	INTERIOR	MECHANICAL	ELECTRICAL	SPECIAL	GENERAL
594,500	9,245,802					
Site GC OH&P	SHELL					
	4,334,488					
G10 Site Prep, Demo & Excav	A10 Foundation A20 Basement	C10 Interior Construction	D20 Plumbing	D5010 Service and Distribution	E10 Specialties & Equipment	Z1010 Project Administration
146,500	1,006,004	528,427	85,927	739,390	492,534	
G20 Site Improvements	B10 Superstructure	C20 Stairs	D30 HVAC	D5020 Lighting & Branch Wiring	E20 Furnishings Fixed/Movable	Z1030 General Conditions
373,000	1,218,797	62,639	824,160		34,000	
G30+40 All Utilities	B20 Exterior Closure	C30 Interior Finishes	D40 Fire Protection	D5030 Security Comm/Data	F10 Special Construction	Z1060 Fee
75,000	2,007,061	1,069,320	109,740		89,520	
G90 Other Site Structures	B30 Roofing	D10 Conveying	Testing and Special Mech	D5090 Other Electrical	F20 Selective Demolition	Z20 Risk and Contingency
	102,626	50,000	91,575	55,500	90,808	587,774

	St. Olaf College Fieldhouse	Carleton College Recreation Center
Completion Date	August 2002	April 2000
Project Duration	14 months	24 months
Gross Square Feet	114,000	85,414
Total Cost (incl. A/E & CM fees)	\$11,716,836	\$13,533,179
Cost per square foot	\$102.79	\$158.44

Results

- ED project - 3 Fundings
- Bed Tower - 4 Fundings
- ARC - 1 Funding

On Time

50% CD's w/ 16% Cont.

[ultimately completed on

but with some space

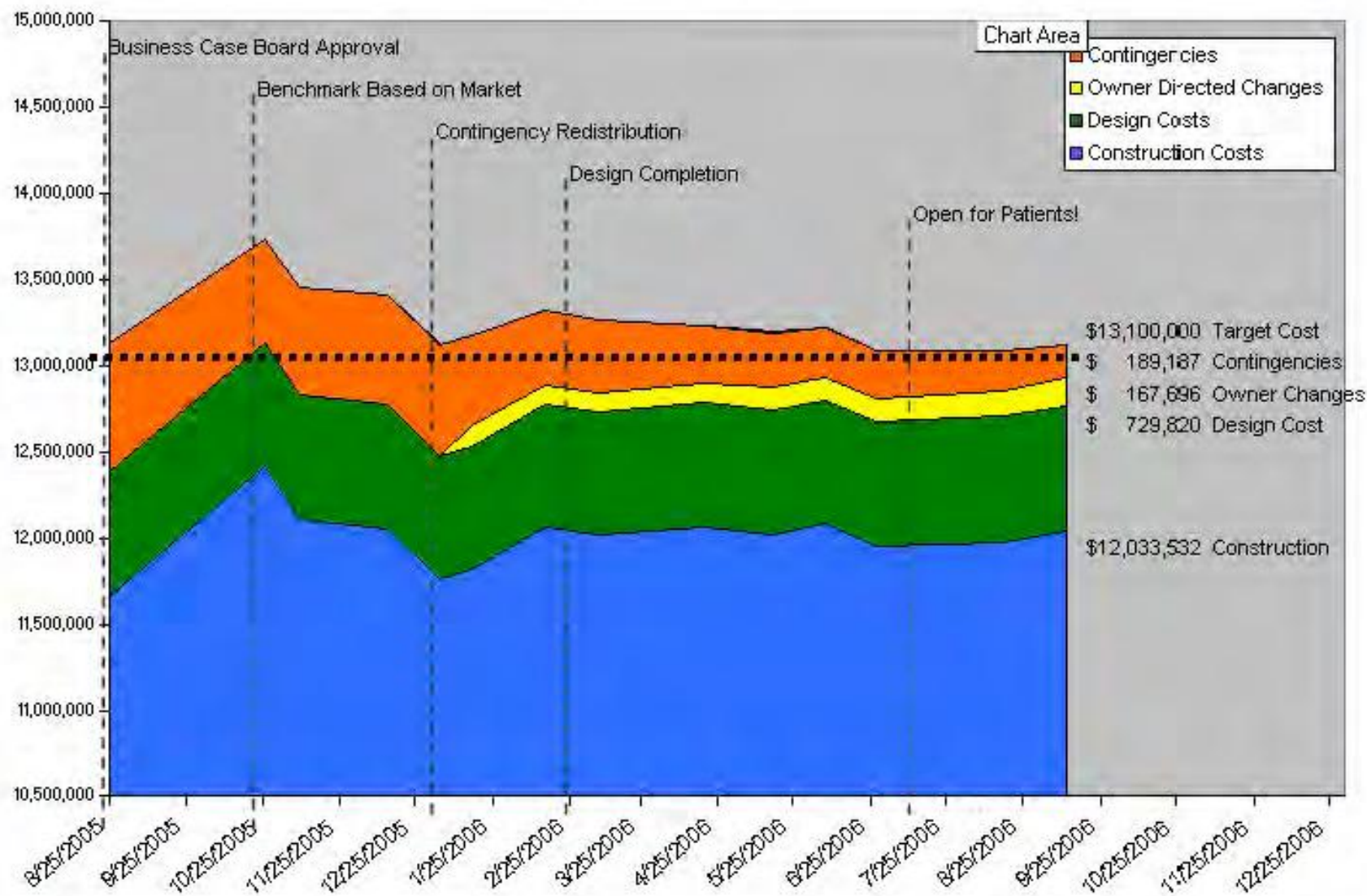
budget,
shelled]

Changes Needed from Current Practice (1 1/2005)

- 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 (1 1/2005)

- 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.



Shawano Clinic

- 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.

Sutter Fairfield MOB

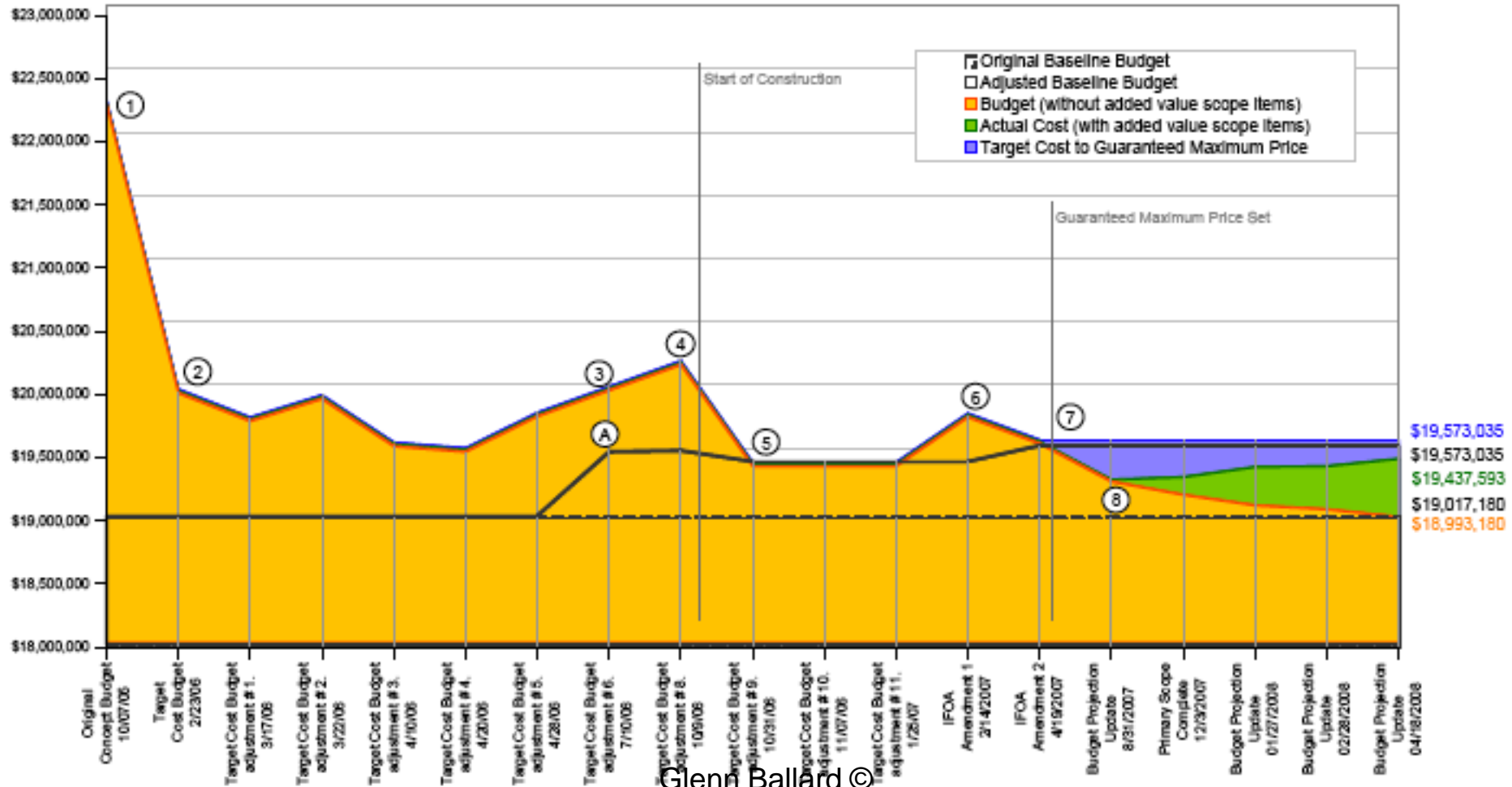
The project was completed in 25 months, despite a 3 month delayed construction start.



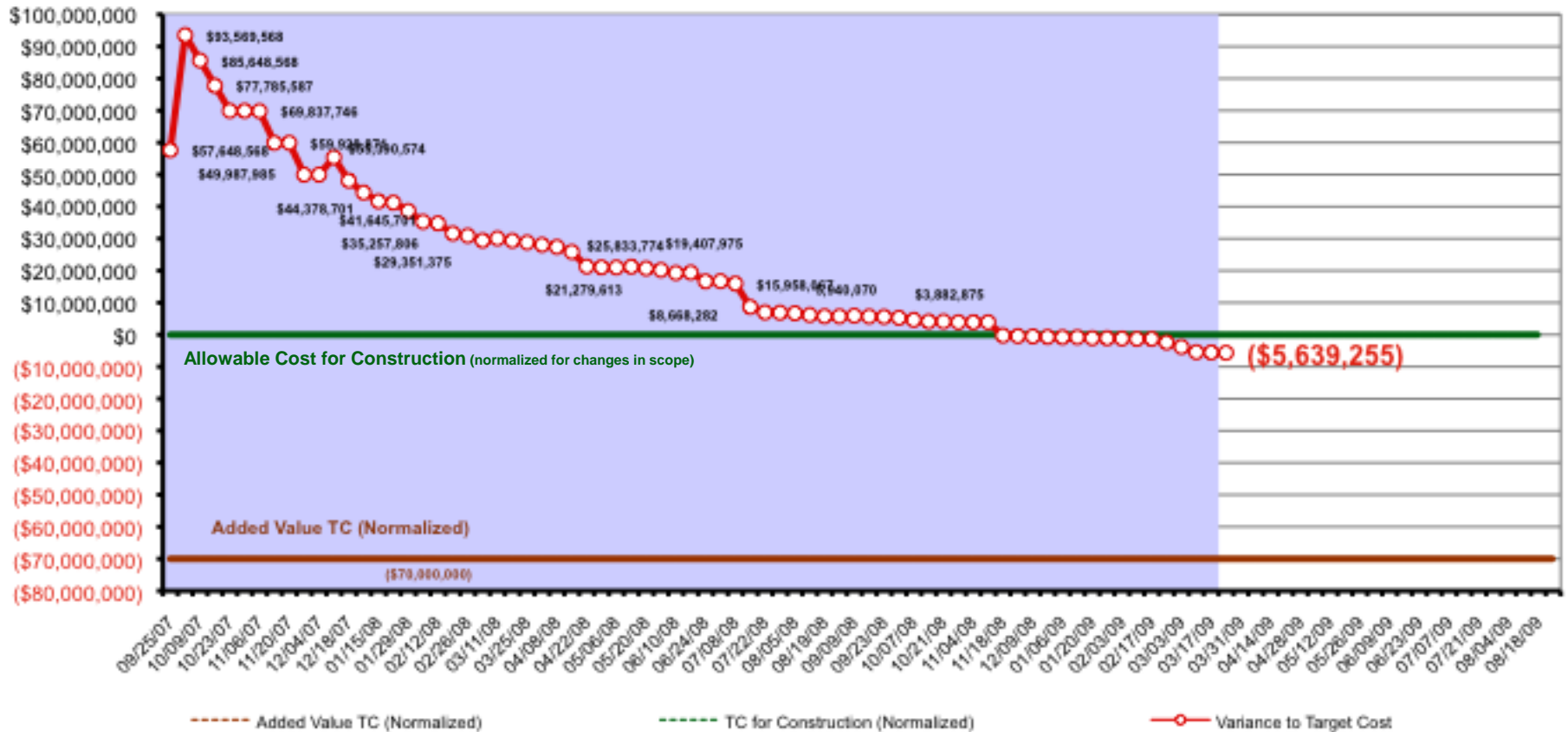
The target cost (\$18.9 million) was set 14.1% below the benchmark (\$22.0 million). The actual cost (\$17.9 million) for the original scope underran the target by 5.3% and underran the benchmark by 18.6%.

Sutter Fairfield MOB

Appendix A - Project Tracking Report Medical Office Building 2 (New Construction)



Cathedral Hill Hospital Project: Expected, Allowable & Target Cost



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

YET



- 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?

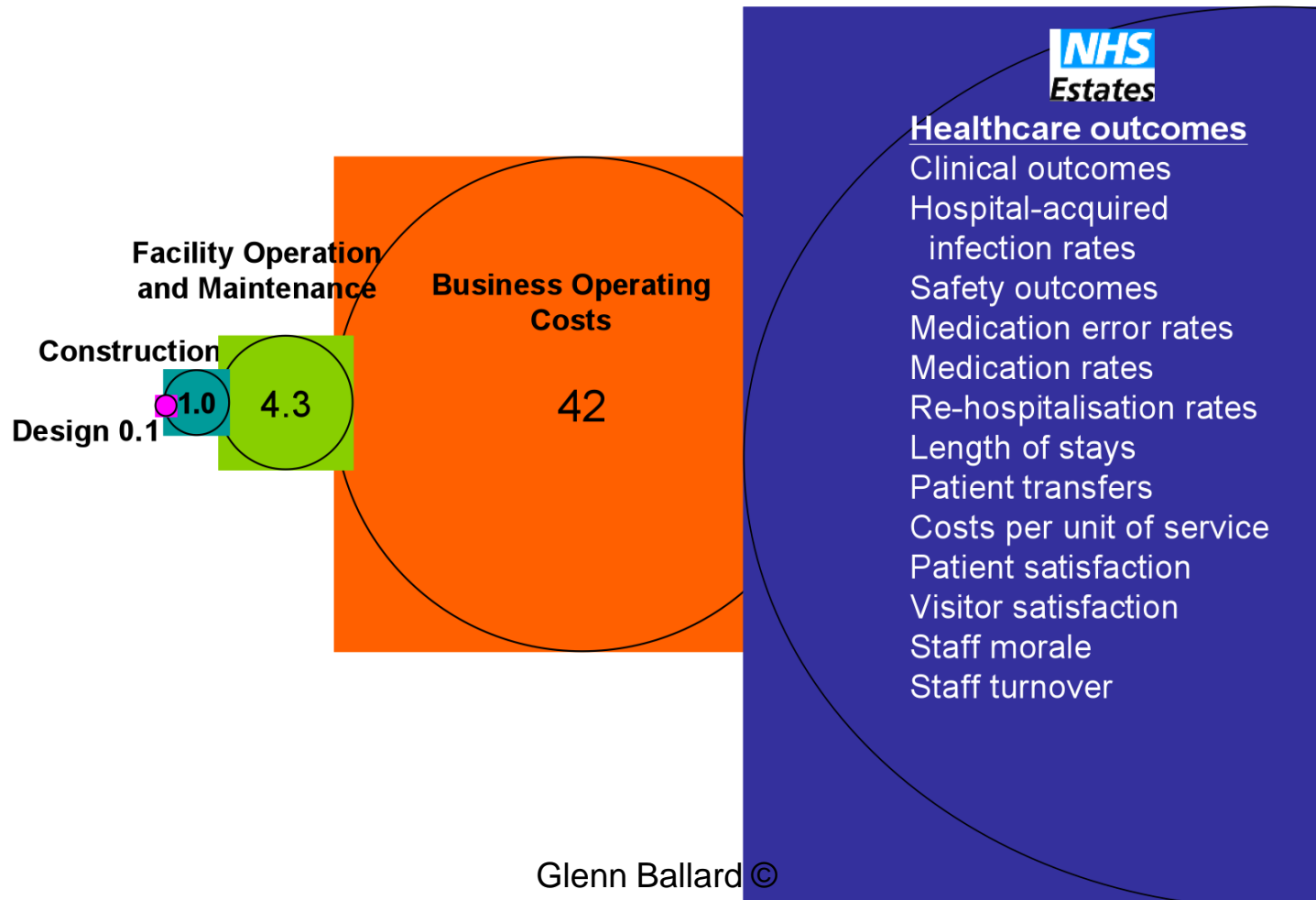
- Scope control – steering design to targets
- Scope refinement/Buildability/Contingency reduction – involvement of specialists in designing
- Proactive value engineering

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



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.

What are your takeaways? Questions?