



The Possibilities of an Integrated Approach

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Learning Objectives

- Identify the distinguishing elements of Integrated Project Delivery.
- Explore how traditional design/construction processes can be transformed to integrated processes.
- Explain business models that support Integrated Project Delivery.

Agenda

- Opportunity of Integrated Project Delivery
- Definition of Integrated Project Delivery
- Building the Team
- Business Models
- Process Change
- Next Steps



Opportunity of Integrated Project Delivery

AIA California Council / McGraw-Hill Construction Change Conference
June 25, 2007

Slide 5

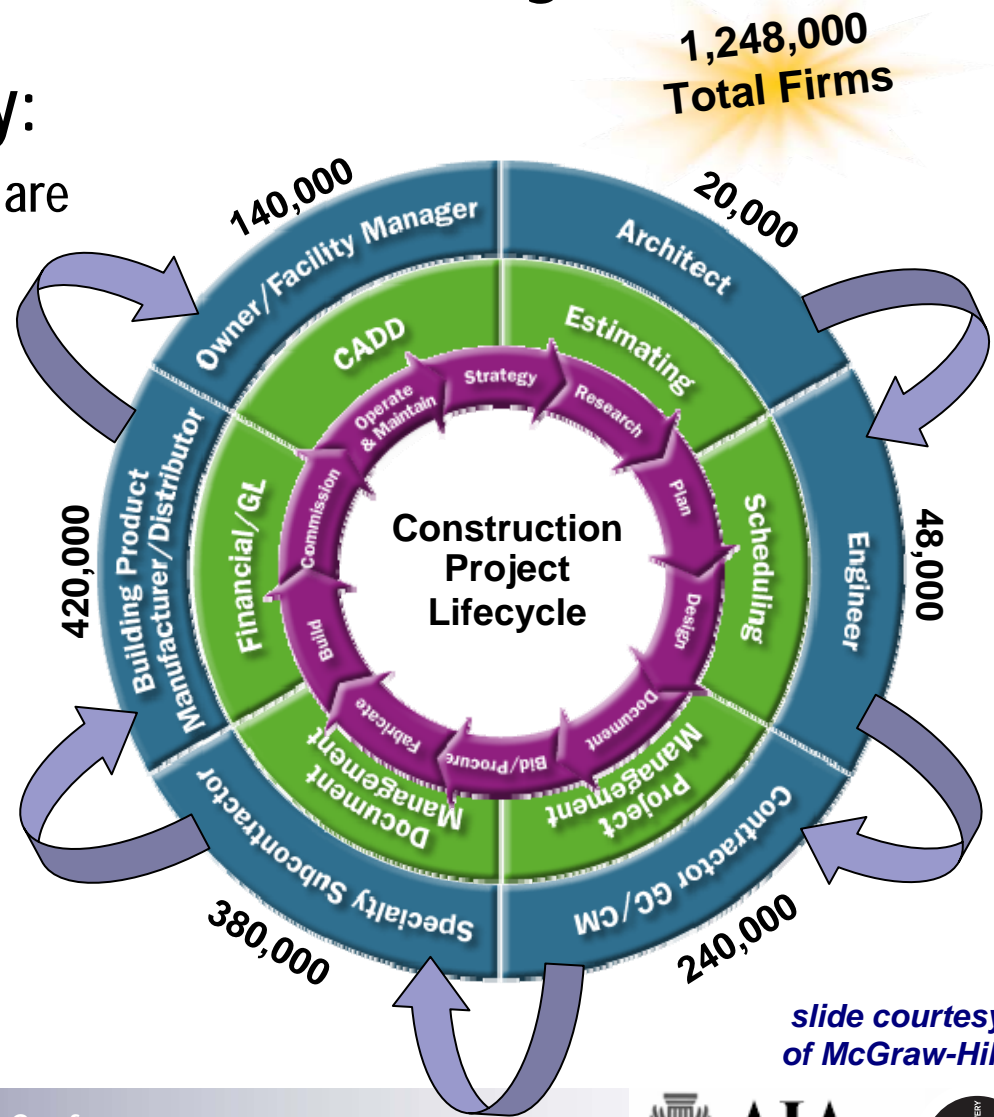
The Industry and Its Players

■ The Construction Industry:

Project-based information exchanges are linear between the players *"Toss-It-Over-The-Fence"*

- Strategy
- Research
- Plan
- Design
- Document
- Bid/Procure
- Fabricate
- Build
- Commission
- Operate & Maintain

- Knowledge is lost in exchanges and players' value isn't optimized



slide courtesy of McGraw-Hill

Integrated Design & Construction

■ Evolving Trends

- More integrated team
 - Earlier involvement
 - Collaborative decision-making
- Technologies to enhance:
 - Collaboration
 - Modeling
 - Visualization
 - Simulation
 - Coordination/Interference checking
 - Quantity takeoffs
 - Offsite Fabrication

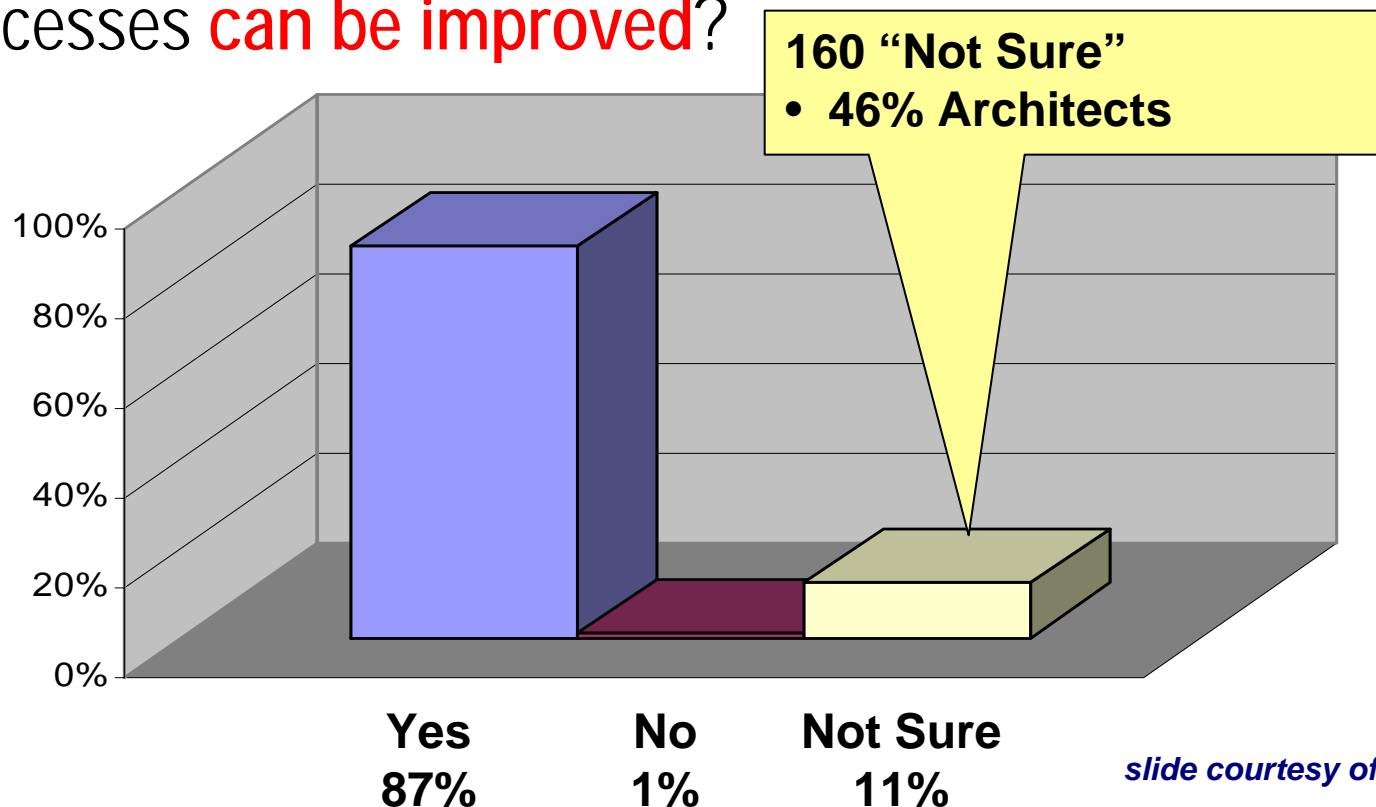


Source: NIBS 2006

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Integrated Design & Construction

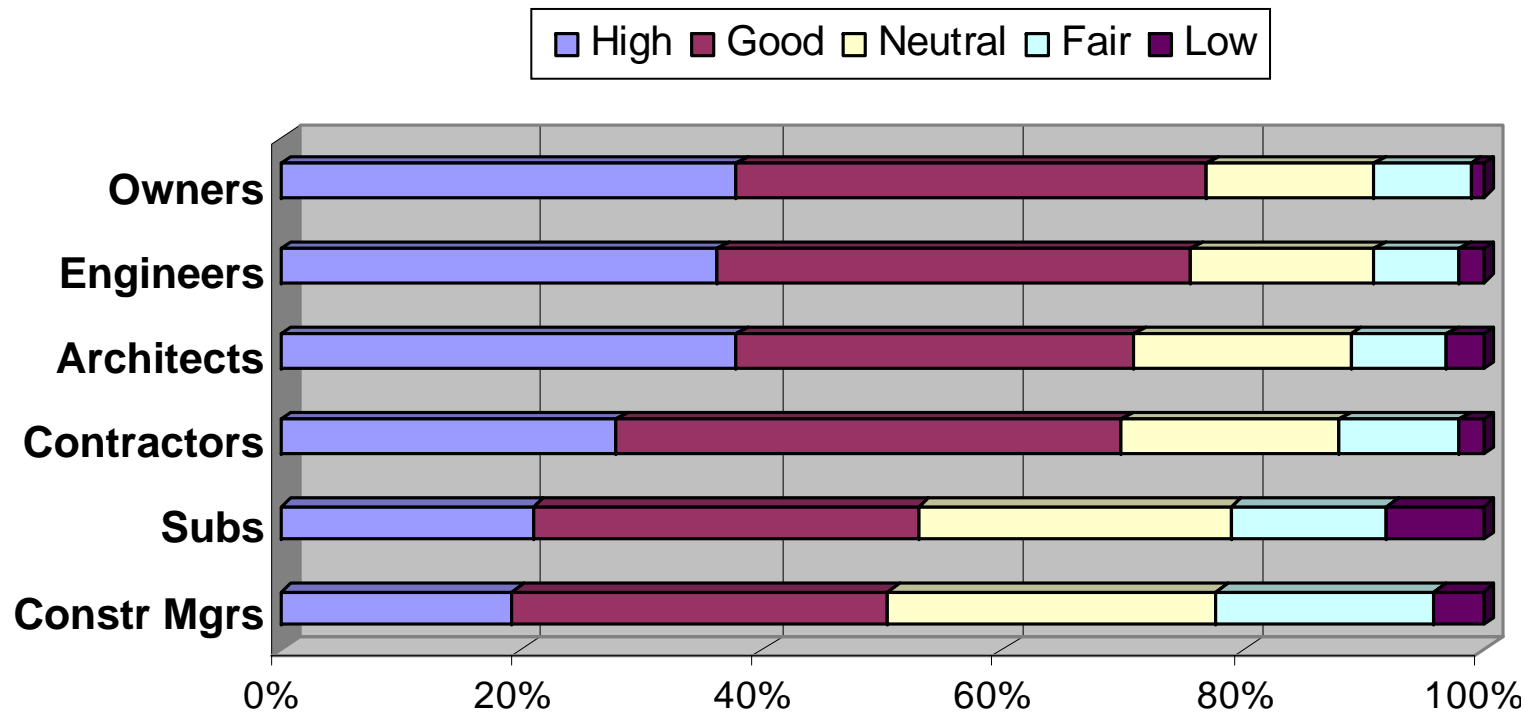
- Do you believe that the current design and construction processes **can be improved**?



slide courtesy of McGraw-Hill

Integrated Design & Construction

- What is your **level of comfort** working with design and construction professionals?



*slide courtesy of
McGraw-Hill*

Integrated Design & Construction

■ How **concerned** are you about

Top Ten

	Owners (Top 2)	Architects (Top 2)	Alignment	
<u>Inflation of construction costs</u>	88%	61%	-27%	} Real Spreads
<u>Unrealistic construction schedules</u>	65%	76%	11%	
<u>Legal liability issues</u>	56%	75%	19%	
<u>Inadequate construction documents</u>	76%	60%	-16%	} Reasonably Good
<u>Design errors and omissions</u>	73%	59%	-13%	
<u>Prompt client payment</u>	54%	59%	5%	
<u>Change orders and claims</u>	75%	73%	-2%	
<u>Conflict among stakeholders</u>	60%	57%	-3%	
<u>Scarcity of building materials</u>	62%	58%	-3%	} <i>slide courtesy of McGraw-Hill</i>
<u>Design/Bid/Build delivery method</u>	60%	62%	2%	



Definition of Integrated Project Delivery

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Our Charge

- Define – Integrated Project Delivery
- Describe – “ How to do it”
- Define roles of major disciplines
- Define roles of subsequent groups- provide enough detail for future committees to act.
- Timetable: Four months-1st draft in 2 months!

Our Hurdles

- BIM – IS – Integrated Project Delivery- Yes?-No?
 - Essential-Yes
 - IPD is bigger than BIM
- We're already doing it!
- The Alliance Model is the only model?



Definition – Integrated Project Delivery

IPD is a project delivery approach that integrates people, systems, business structures and practices into a process that collaboratively harnesses the talents and insights of all participants to reduce waste and optimize efficiency through all phases of design, construction and fabrication.

Definition – Integrated Project Delivery

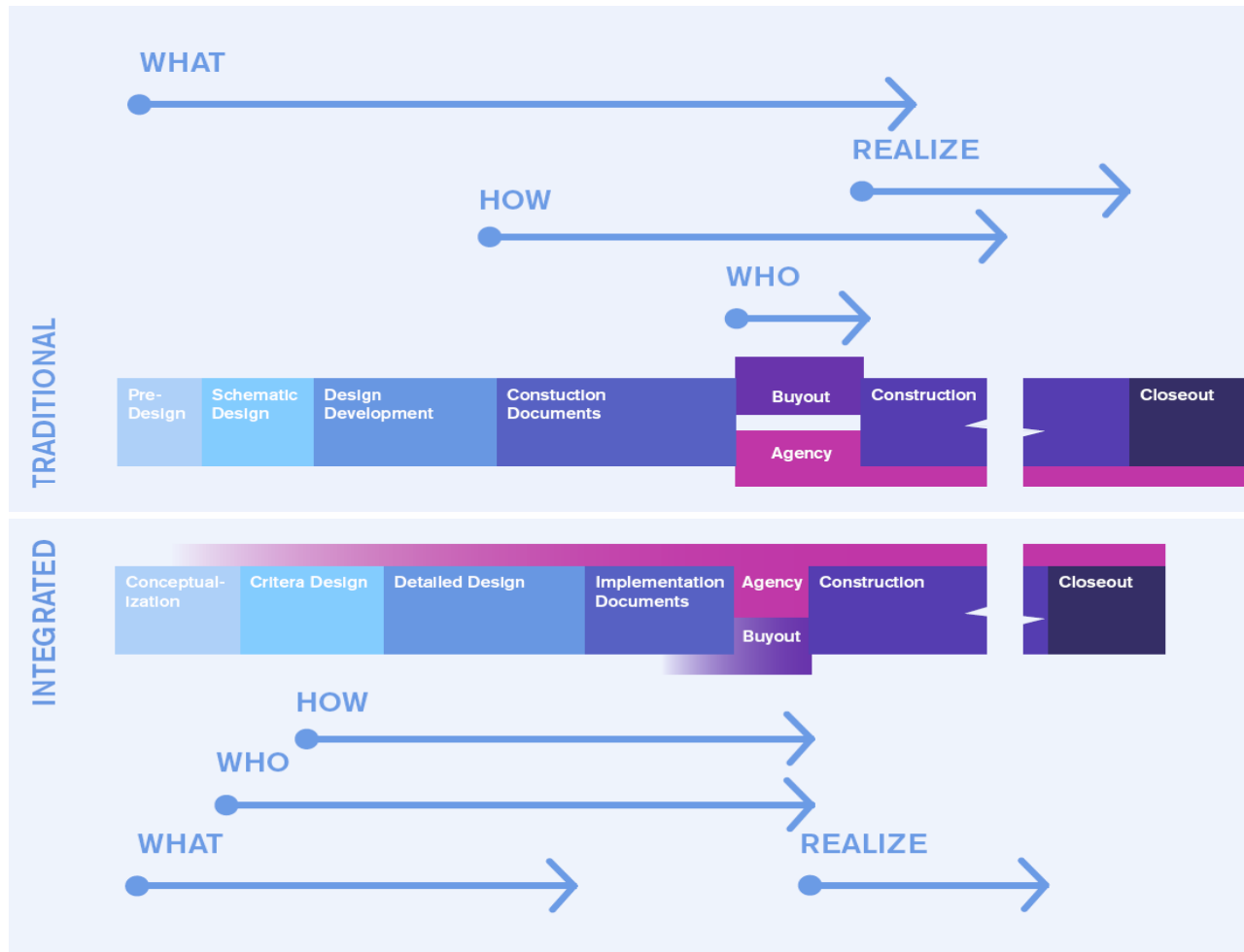
IPD principles can be applied to a variety of contractual arrangements and Integrated Project Delivery teams will usually include members well beyond the basic triad of owner, designer and contractor. At a minimum, though, an Integrated Project includes tight collaboration between the owner, architect/engineers and builders ultimately responsible for construction of the project, from early design through project handover.



Fundamental Principles

- Mutual Respect
- Mutual Benefit
- Early Goal Definition
- Enhanced Communication
- Clearly Defined Open Standards
- Appropriate Technology
- High Performance
- Leadership

Delivery Process



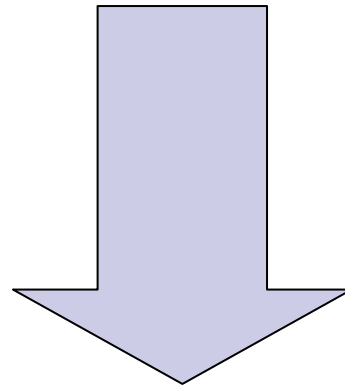


Building the Team

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Building an Integrated Team

Requires a Shift in the Way We Think



Resulting in a Shift in the Way We Relate



Building an Integrated Team

- New Paradigm Requires A Mental Shift
 - Teams Make Better Decisions than Individuals
 - New Way Of Relating
 - New Tools for Team Decision Making
 - No Silos

Building an Integrated Team

- Owner Chooses
 - Led by Architect / Contractor / CM / Other?
- Other Team members brought on at first available opportunity
- Team remains together throughout project
- Team is vested and focused on outcome from beginning
- Control is given up, in favor of Collaboration



Business Models

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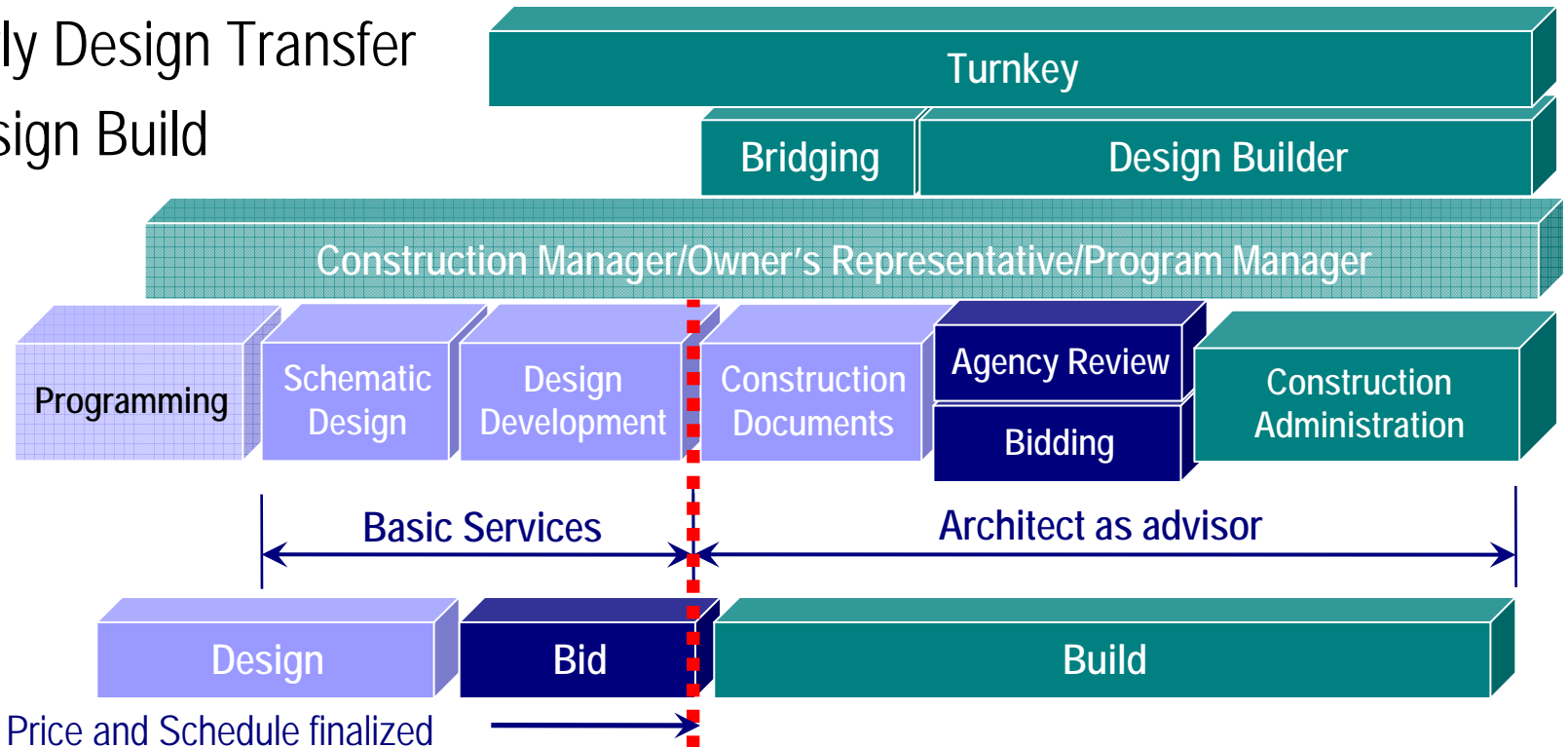


Elements of an Integrated Project Delivery Business Model

- Early Involvement of Key Participants
- Equitable Balance of Risk and Reward
- “Best for Project” Compensation Structures
- Responsibilities Clearly Defined Without Stifling Communication and Risk Taking
- Team Oriented Management and Control Structures

Business Model Examples

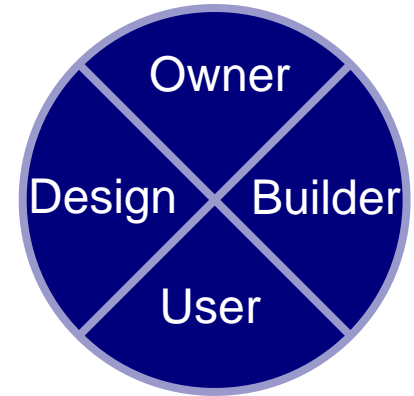
- Negotiated Select Team
- CM At-Risk
- Design Assist
- Early Design Transfer
- Design Build



Case Study: Project Alliance

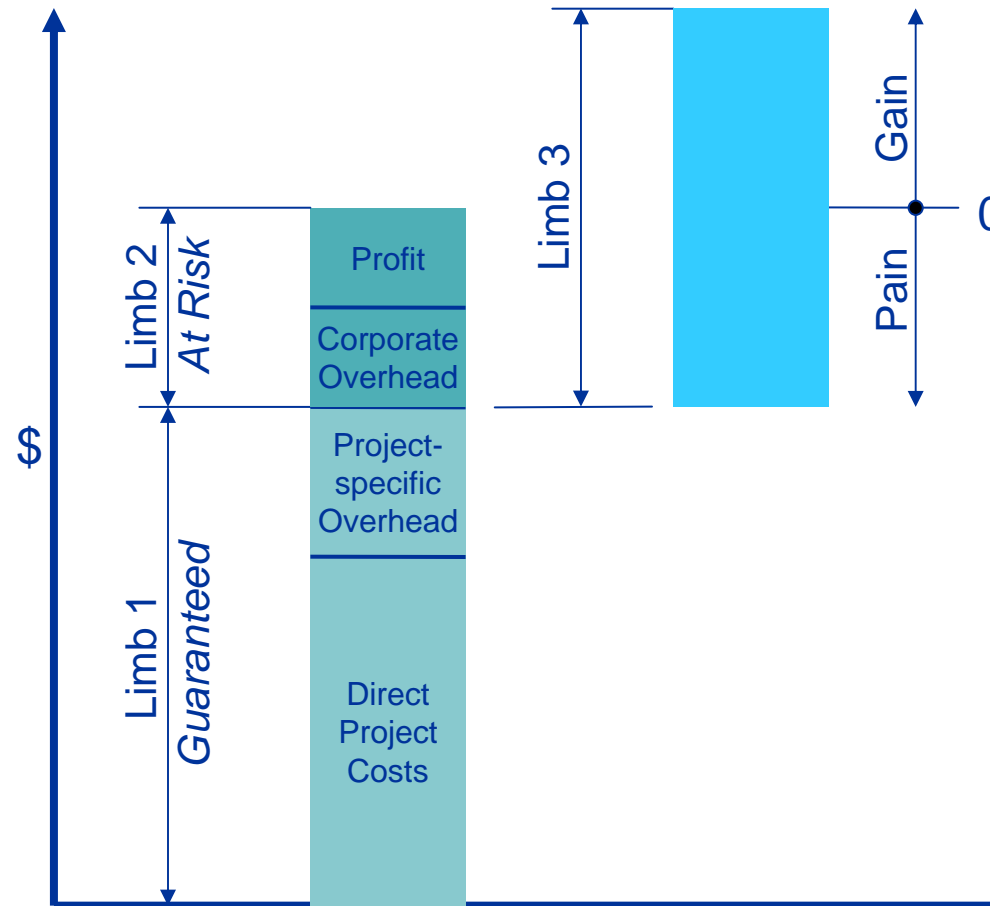
Enforceable No-Blame Contract

- Collective obligations
- Specifically limited right of action
- No prescribed dispute resolution mechanism



Case Study: Project Alliance

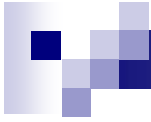
Shared
Risk/Reward



Case Study: Project Alliance

Cost vs. Non-Cost Risk/Reward

- Key Results Areas (KRA's) of importance to the owner are identified.
- A benchmarking and measurement system is agreed upon to determine a score for each KRA.
- An Overall Performance Score (OPS) is calculated as a weighted average of the KRA scores.
- The OPS is used to adjust Limb 3 up or down.



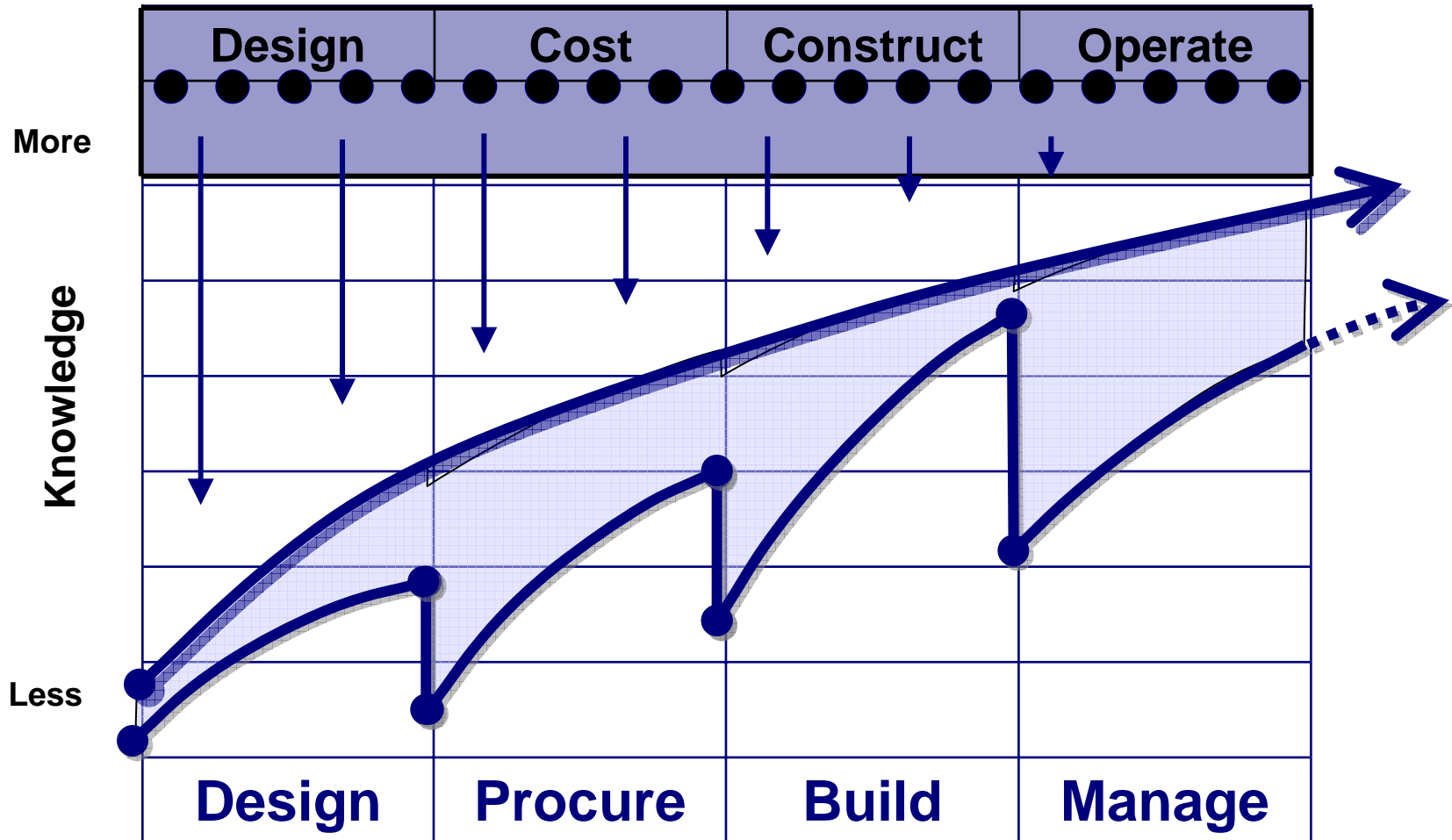
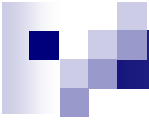
Process Change

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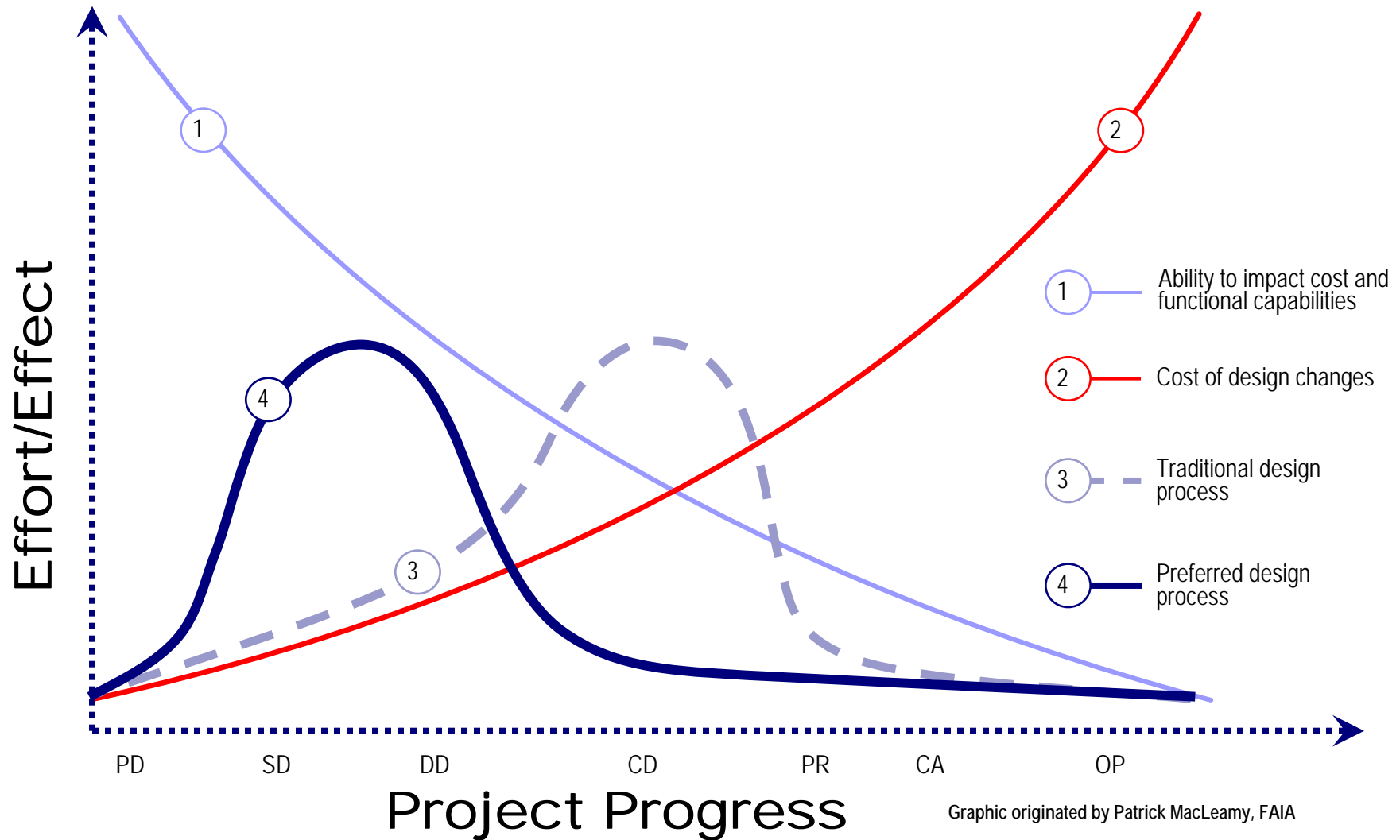
Integrated Project Delivery strives to provide

1. Scope clarity
2. Efficient documentation
3. Change order free environment
4. Field efficiency
 - Elimination of re-work
 - Labor optimization
 - No material waste

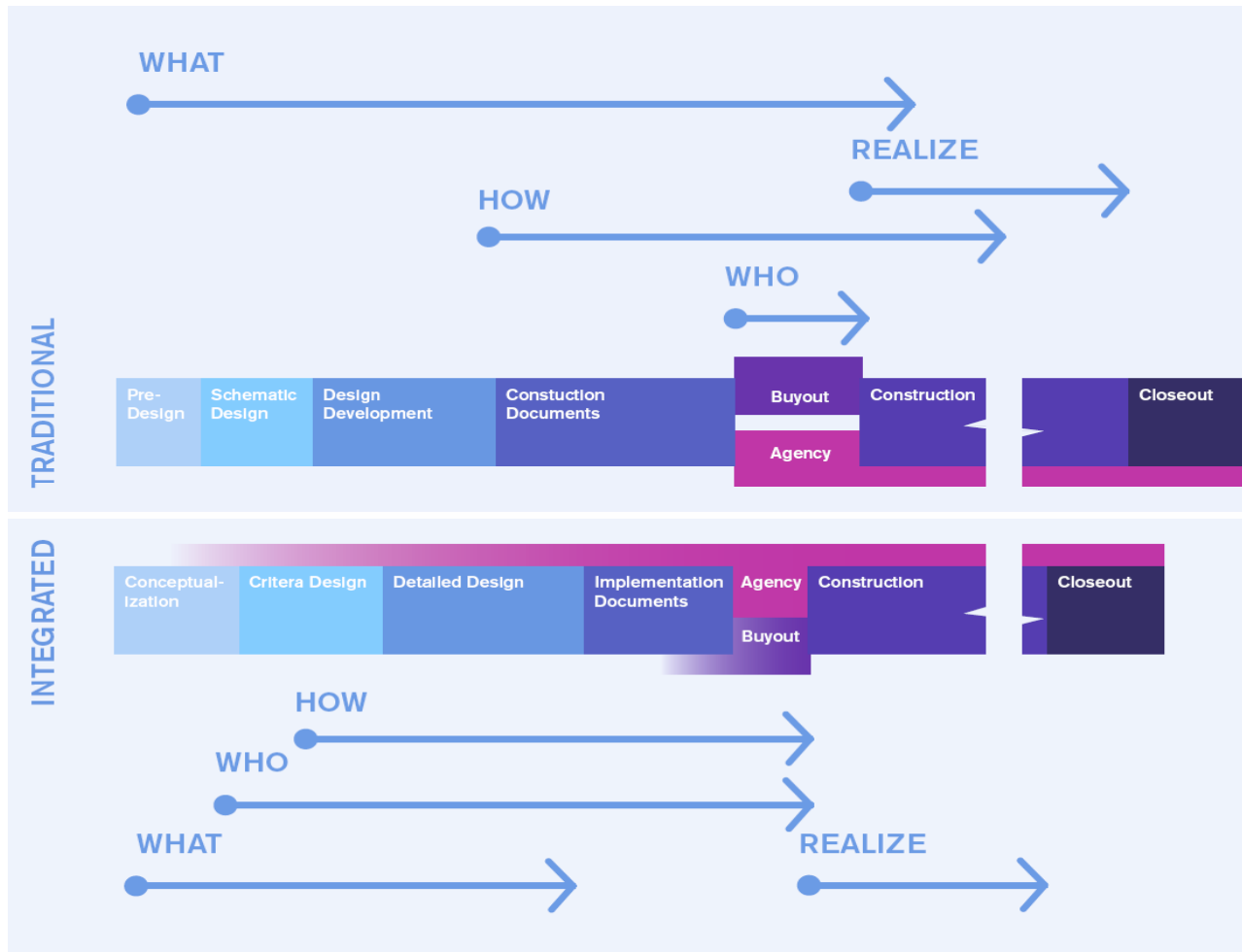
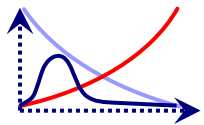
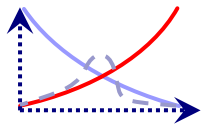


slide courtesy of Autodesk

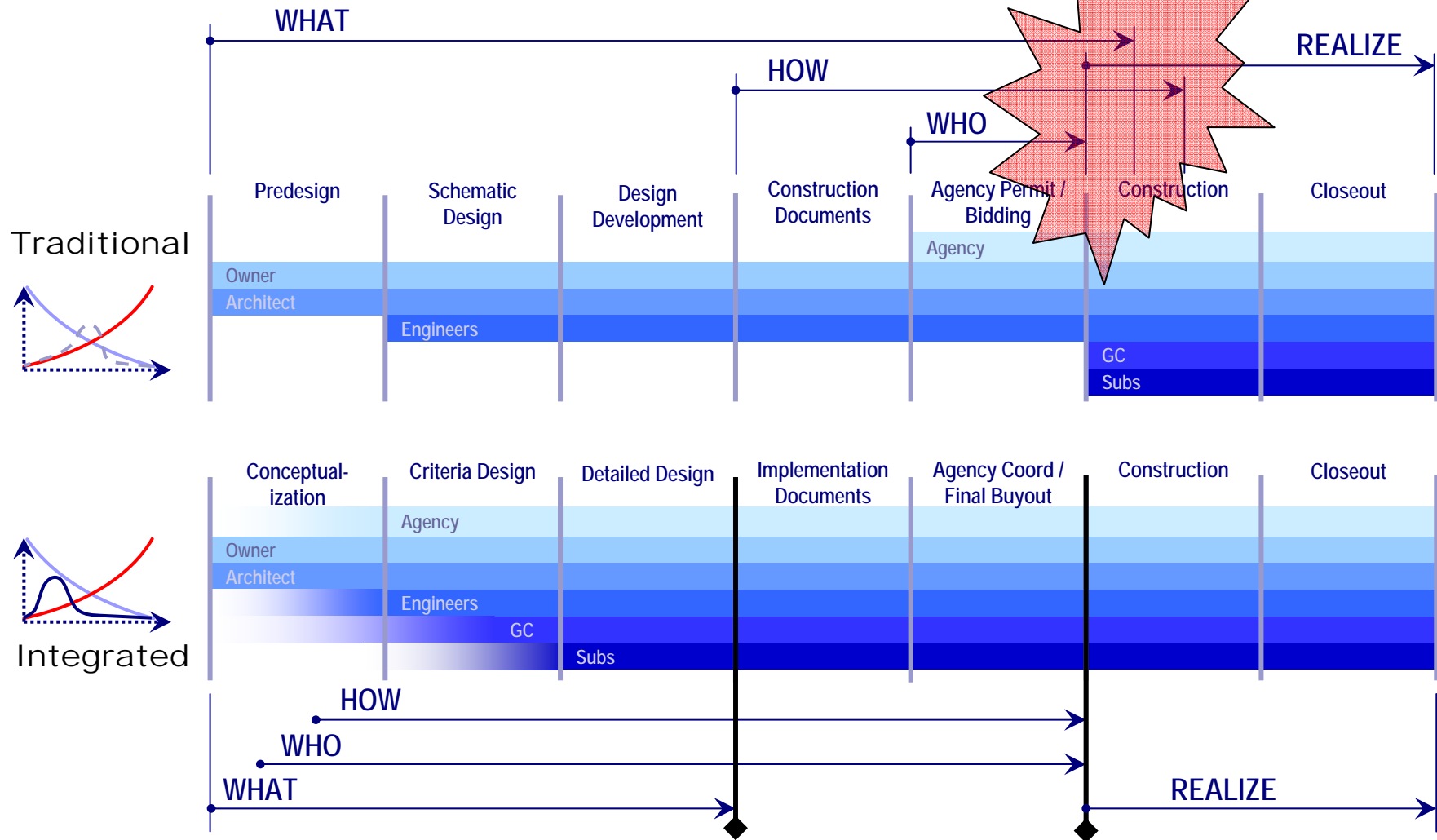
Project Effort and Impact



Delivery Process



Delivery Process

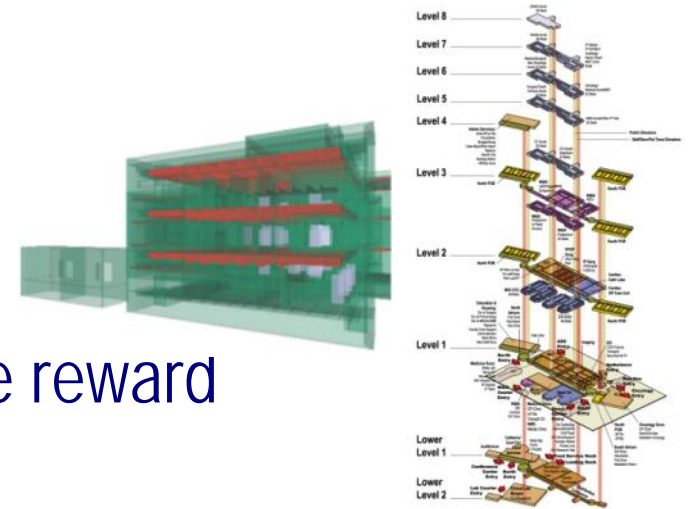


Conceptualization

1. Assembling an Integrated Team
2. Rigorous performance goals
3. Informed cost structure
4. Define success metrics for sharing the reward
5. Determine risk sharing structure
6. Consider starting a Building Information Model



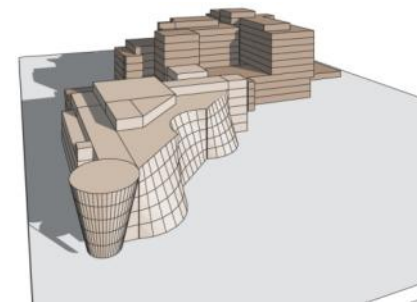
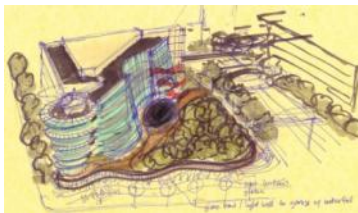
WHAT / WHO / HOW



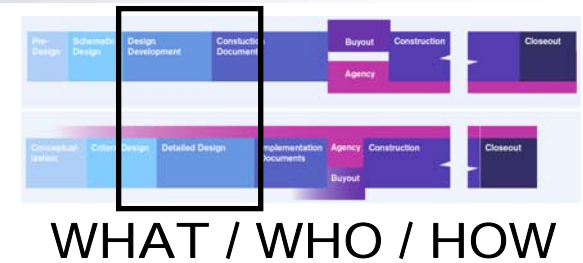
Criteria Design



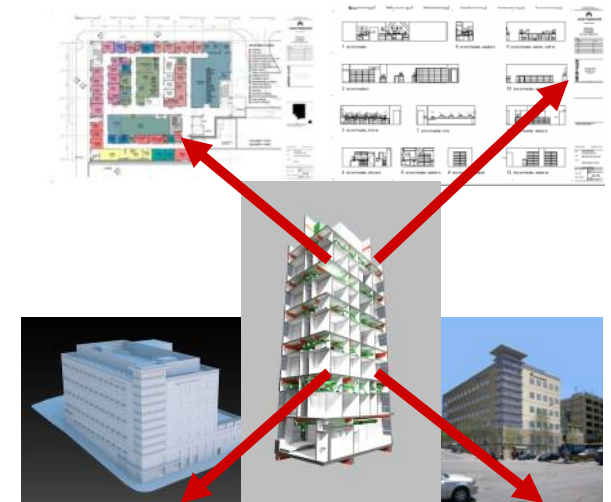
1. Change in design fee structure to accommodate integrated delivery model and producing more information early
2. Begin creating a BIM of what is going to be built
3. What You See Is What You Pay for (WYSIWIP)
4. Trade involvement



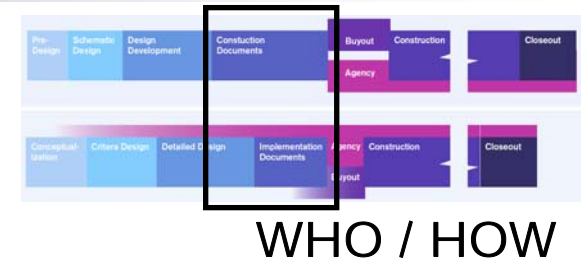
Detailed Design



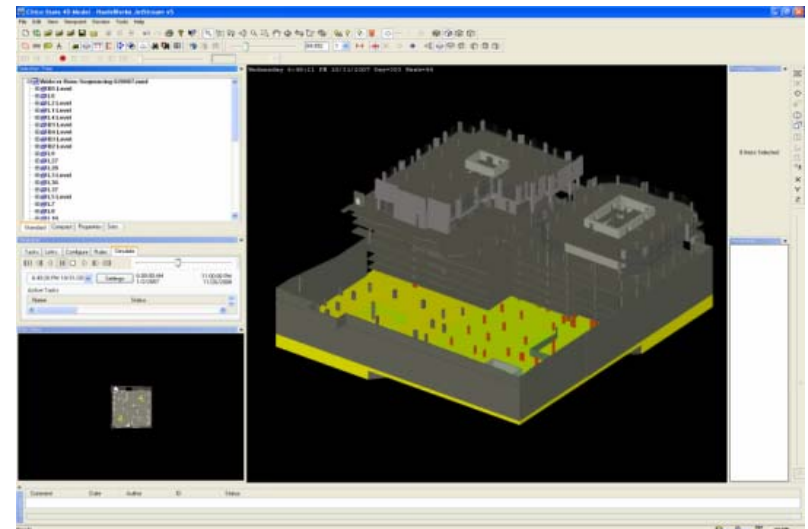
1. Design intent is fully, unambiguously defined, coordinated and validated
2. Phase comprises more effort because more is accomplished.
3. Supplier and vendor insight solicited and incorporated.
4. Material and process quality levels are established.
5. Tolerances between trades established to enable pre-fabrication.



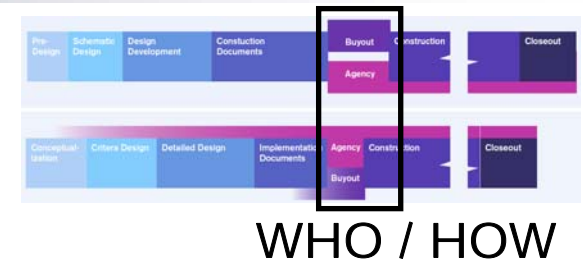
Implementation Documents



1. Phase comprises less effort because definition, coordination and validation have already been accomplished.
2. Focus is on how to realize
3. Cost is known with certainty
4. Early buy-out can commence
5. Opportunity for pre-fabrication
6. Rehearsal of construction is enabled through 4D



Agency Review



1. Agency review time and effort can be reduced through early participation of stakeholders.
2. Building Information Models provide opportunity for automated code analysis and permit approval.

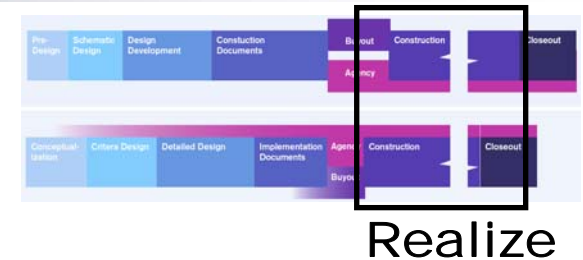
Buyout



WHO / HOW

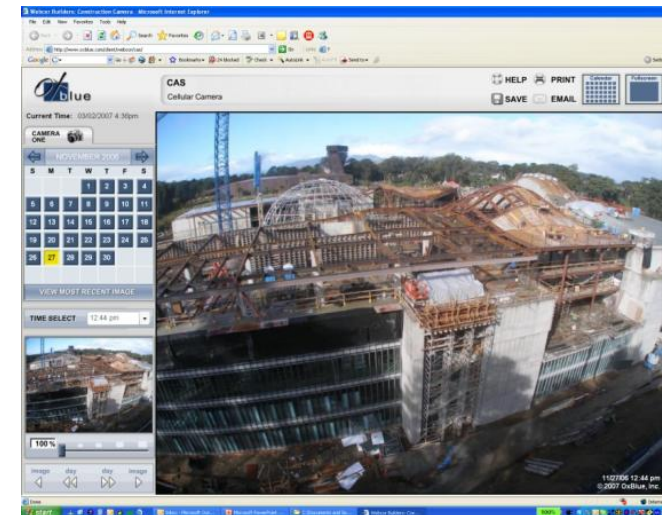
1. Prices from subs and suppliers involved during design are already finalized
2. Building Information Model supports consistent quantity of material bids
3. Early trade involvement requires guarantee of them building the project.

Construction



1. Construction process is streamlined and accelerated because:

- Scope definition is complete and clear
- Building system coordination is fully worked out
- Construction schedule is optimized through 4D testing and rehearsal
- Procurement items with long lead times are specified early and are available when needed
- Early involvement of regulatory agencies allows timely permit approval
- Increased opportunity for prefabrication leads to less waste and fewer injuries.



2. Improvements in construction process result in reduced administration effort

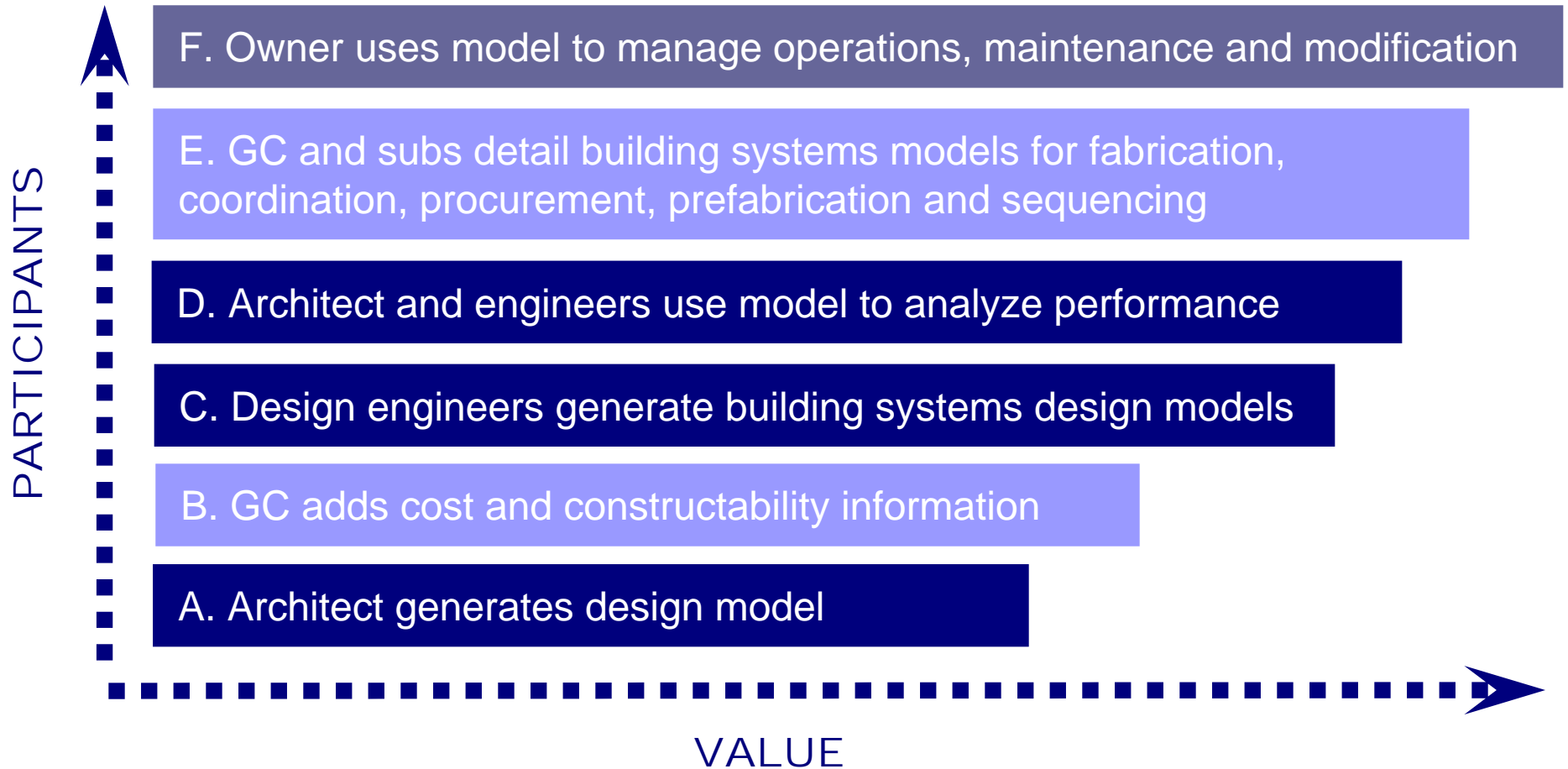
3. BIM is updated to coordinate with installed conditions

Standards

- Clearly Defined Open Standards - open and interoperable data exchanges based on a disciplined and transparent data structure is essential to support Integrated Project Delivery.
- Statements of Open Standards and Interoperability referenced from the **National BIM Standards (NBIMS)**
 - <http://www.facilityinformationcouncil.org/bim/publications.php>
- **International Alliance for Interoperability (IAI) buildingSMART Alliance** – an **international** organization working to facilitate software interoperability and information exchange in the AEC/FM industry
 - <http://www.iai-na.org/>

Information Provided by Sutter Foundation Health and DPR Constructions

Integrated Project Delivery with BIM



Summary

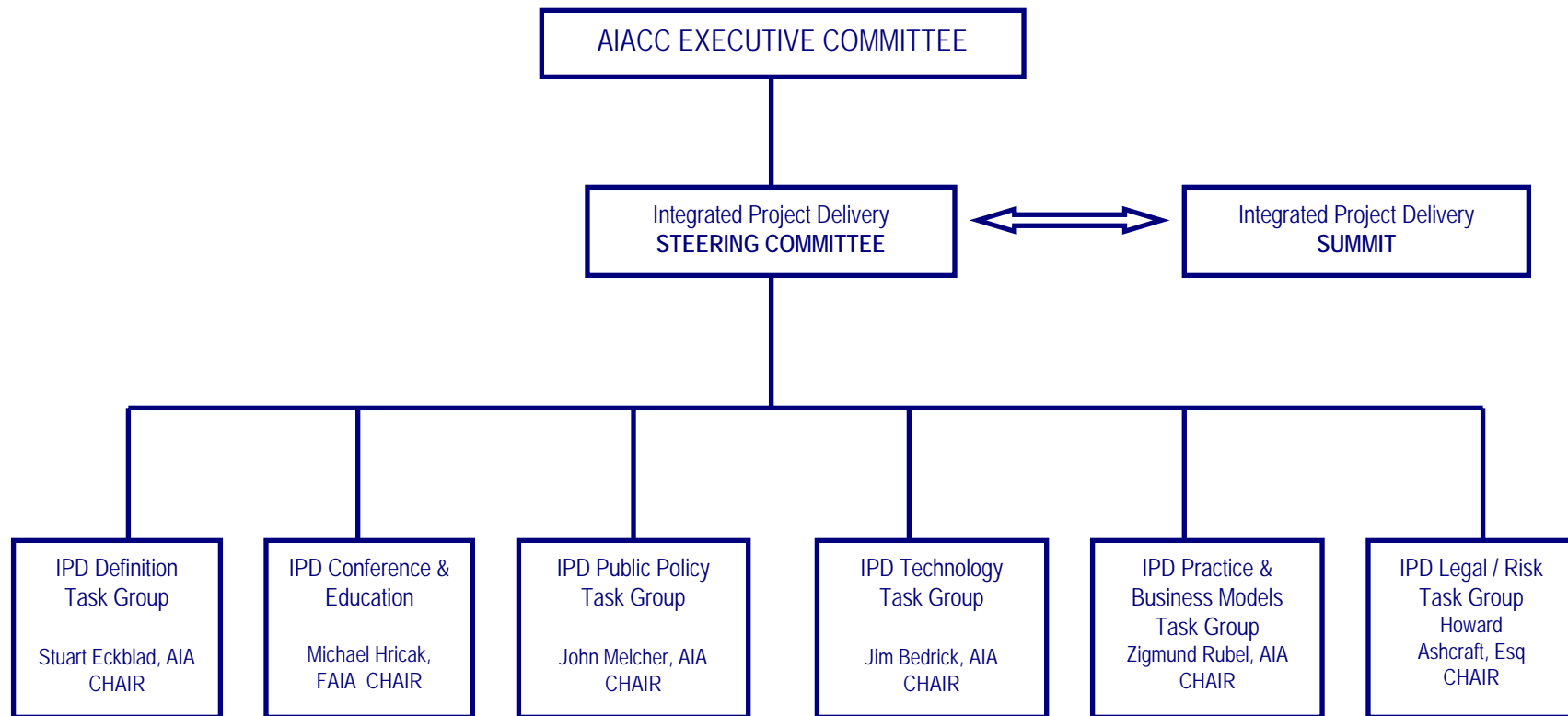
- Early involvement of key stakeholders
- Teamwork with shared risk
- Systems coordination occurs earlier
- Team members benefit directly from improved Team performance
- BIM greatly enhances collaboration and quality of construction documentation



6


Next Steps

Integrated Project Delivery Committee Organization







A Working Definition



Integrated Project Delivery



AIA California Council



McGraw-Hill
CONSTRUCTION

Dodge
Sweets
Architectural Record
ENR
Regional Publications

INTEGRATED PROJECT DELIVERY - CALIFORNIA




IPD Main Page | IPD Definition | IPD Business Models | IPD Public Policy Issues | IPD Legal and Risk Issues | IPD Technology Issues | IPD Additional Resources

Search 

This website reflects the work of various committees on implementing an Integrated Project Delivery System for construction projects in California and across the country. We felt the first step in the process should be to define an Integrated Project Delivery method that parties from all disciplines could support. A Definition Committee was selected consisting of architects, engineers, contractors, sub-contractors, owners and attorneys. [A Working Definition: Integrated Project Delivery](#) was the result of their efforts. The document is considered a work in progress, and the committee invites comments and suggestions. Subsequent committees have been formed to work on multiple issues related to the implementation of an integrated project Delivery System. In an effort to advance the program, the committees are working in parallel. The general areas of focus are:

The work of each of these committees, and expected future committees will be available on this site. In addition, we will attempt to provide additional resource information on the subject. We invite you to send your suggestions to IPD@aiacc.org

The Integrated Project Delivery Task Force is an interdisciplinary group sponsored by **McGraw-Hill Construction** and **The American Institute of Architects , California Council**.

[AIA CC FAQs](#)

<p>IPD Public Policy Group - Chair: Phil Bona, AIA</p> <p>Define legislative barriers to IPD and identify advocacy efforts to support the implementation of IPD in publicly funded building projects.</p>	<p>IPD Legal/Risk Group - Chair: Howard Ashcraft</p> <p>In coordination with the Business Models Group, assess the business structures, risk allocation, key contractual terms, and related legal issues.</p>
<p>IPD Business Models & Practice Group - Chair: Zigmund Rubel, AIA</p> <p>In coordination with the Legal/Risk group, define alternative business and organizational models, skill sets and training required to support Integrated Project Delivery for various project/ownership configurations.</p>	<p>IPD Technology Group - Chair: Jim Bedrick, AIA</p> <p>Define the electronic collaborative tools, systems and software available, the specifications, standards and protocols required to support IPD</p>

www.ipd-ca.net