



Executive Summary

This report will focus on the analysis of integrated project delivery for the Sears Centre project. Currently, the Sears Centre is using a Design-Build approach provided by Ryan Companies (*Minneapolis Based DB-Contractor*). As projects become more complex, owner-contract requirements continue to expand, resulting in an increase need for construction entities to become versatile in design, construction and financing processes. Equally important to the constructability of complex projects is the approach to delivery, which is inclusive to Operations and Maintenance concepts. However, majority of project prototypes that employee known methods of integrated delivery are government properties, infrastructure and public consortiums. Due to the fact that the private industry is experiencing an increase in business, related to complex scopes, an evaluation of integrated delivery for non-governmental projects can be resource effective overtime.

This research will involve a detailed analysis of the project delivery system selected for the Sears Centre. Proposed method of evaluating this condition will include:

- ✚ Documentation of alternative project delivery systems
- ✚ Appropriate contract selection
- ✚ Predecessor PDS Selection Summary
- ✚ Construction Contract Selection Summary
- ✚ Integrated Delivery Documentation:
 1. *P³ Validity of Public Private Partnerships*
 2. *Validity of BOT-Build Operate Transfer Model*
 3. *Validity of DBOM-Design Build Operate Maintain Model*

The recommendation to pursue an integrated delivery system for the Sears Centre will be validated by the results outlined in this accompanying report. Underlying conditions affecting the selection of the proposed integrated delivery system are (1) Time Reduction Assessment (2) Project Costs/ Budget Compatibility (3) Maintenance/ Operations budget identification and (4) Payback contributions with time durations. Integrated delivery systems selected will incorporate all of the benefits of using the Design Build approach (Construction) with FSM (Facility Service Management). In addition to the required project services outlined in this document, an evaluation of the construction entities procurement network will have to be referenced to determine internal feasibility of proposed delivery systems. Four out of Five construction entities have validity request for research in this proposed area. Each surveyed entity has different methods for pursuing integrated delivery systems. One important aspect to consider is the level of competence an organization has in (1) Internal Accounting-Cost Recapturing Strategies, (2) Property Management via "In-House/ Joint-Venture and (3) Financial procurement strategies. When these strategies are incorporated into Full program delivery, projects can be delivered with smooth adherence to time and budget constraints.



Integrated Delivery Systems Study for the Sears Centre

Project Origin at “Glance”:

The village of Hoffman Estates is seeking to generate revenue from a highly competitive arena entertainment market. The plan will require physical provision for family shows, concerts and moderate to large sporting events. In addition to basic event requirements, the village has recognized the need to provide a building of high quality, patron comfort and accessibility capable of representing the surround Northwest “Chicago-land” Region.

Program Requirements & Fixed Constraints

- ✚ *Fixed Date*
- ✚ *Fixed Budget*
- ✚ *Quality Patron Suites*
- ✚ *Grade Level Parking*

Scope Background

The Sears Centre is a landmark project, design and constructed by Ryan Companies US, Inc. The project will primarily consist of an 11,000 seat sports and recreation facility, 2,500 + spaces for patron parking and approximately 42 acres of landscaping and infrastructure. Ownership for this project will be shared between two parties (*Sears & Roebuck Company and CCO Entertainment*). Like most high profile project, a partnership is present and essential for program and project structure.

Programming framework was structured to secure the fixed turnover date. As a result CCO Entertainment, LLC (*Limited Liability Corporation*) was formed from members of the design-build company and a newly acquired arena entertainment management firm. The second component of the project delivery systems is obtaining a high profile project participant as a partner in land acquisition, obtaining financial backing via notoriety and regional publicity. The Prairie Stone Business Park offered the greatest opportunity for business ventures which supports this type of arrangement. In addition to providing nearly 780-acres of undeveloped land, an ease of access has been create from sources of close proximity such as Sears & Roebuck Headquarters, Marriott Hotel and Conference Center (*Northwest*) and O’Hare International Airport.

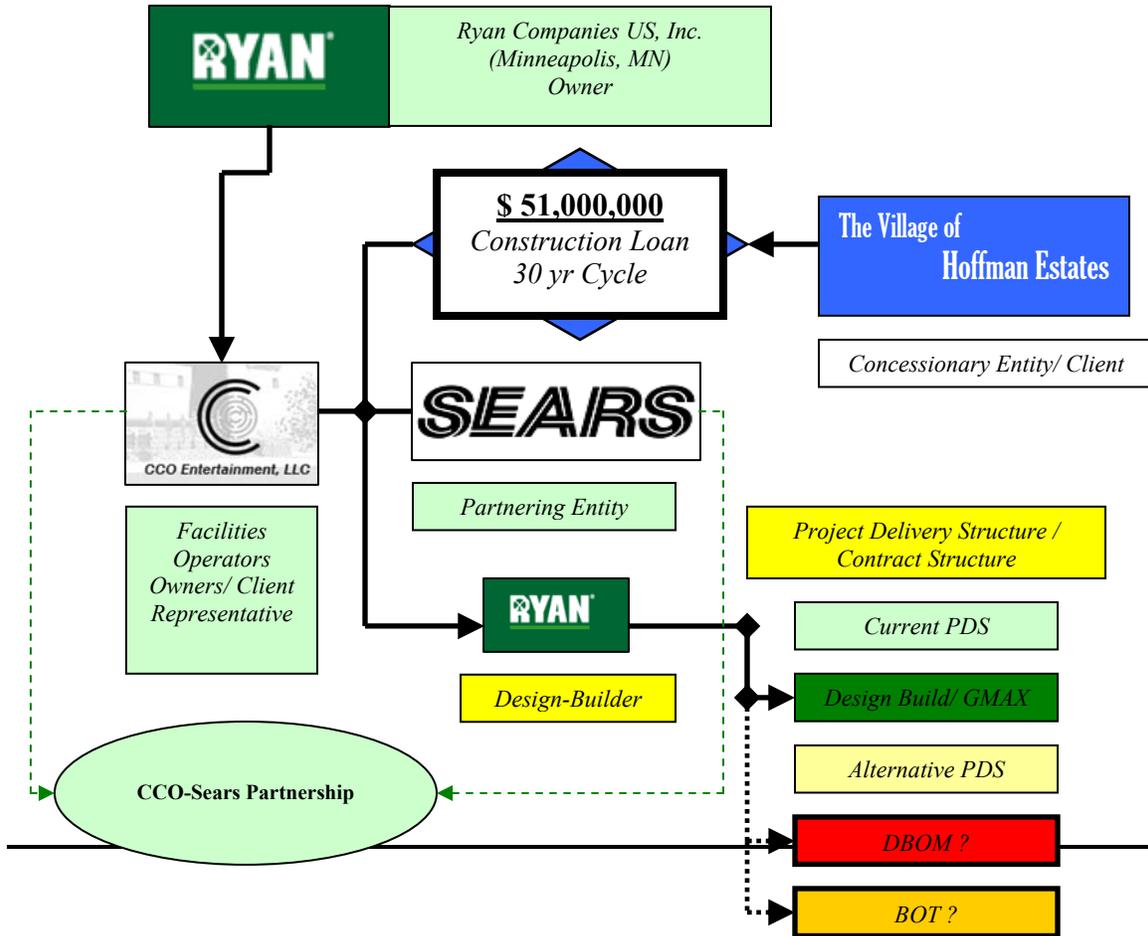
After acquiring a partner and securing land rights, CCO Entertainment and Sears & Roebuck Company secured a \$ 51,000,000 bond from the Village of Hoffman Estates. Ryan Companies has been selected to design and construct an arena facility capable of providing all amenities. Part of the agreement is provision for a facilities pay back period of 30-years. Since a special relationship exist between construction entity and owners, pre-construction services have been requested to include but are limited to the following:

- ✚ *Value Engineering*
- ✚ *Best practices/ Design and Construction*
- ✚ *Procurement Services*
- ✚ *Integrated Design and Delivery*



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Program Delivery Structure:



Key Project Constraints:

- ✚ Project Budget-“Fixed Budget”
- ✚ Commercial Loan Pay-back Duration
- ✚ Building Maintenance/ Facilities Operations Cost
- ✚ Project Turnover Date

Project (Scope) Complexity:

In order to successfully evaluate optimum delivery methods of this project, several factors had to be determined post initial conception. Factors included but not limited to the project are arranged in order of precedence.



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1. “Just-in-time” Facilities Delivery (*Must be met to counteract any liquidated damage clauses between facilities management/operations and entertainment clients/ sports franchises.*)
2. Cost Incursions (*Additional design and construction cost beyond commercial loan*)
3. Facility quality implementation measures which fits within the prescribed budget but exceeds that of the neighboring All-State Arena (*Rosemont, IL*).
4. Arena Maintenance and Operation Costs
5. Commercial Loan Repayments
6. Project Delivery Scheme (*How to merge Design-Delivery-Operations?*)

These three items will be used to determine the organization of the project delivery system, client-contractor contract and subcontracts for the Sears Centre project.

Existing Contract Types:

Project Participant Agreement	Contract Type	\$ Contract Value
<i>The Village of Hoffman Estates-CCO Entertainment</i>	<i>Commercial Loan</i>	<i>\$ 50,000,000</i>
<i>CCO Entertainment-Ryan Companies</i>	<i>GMAX</i>	<i>\$ 50,000,000 (less FFE Budget)</i>
<i>Ryan Companies-Walsh Bishop Architects</i>	<i>Lump Sum</i>	<i>(3%-6%) Construction Budget</i>
<i>Ryan Companies-Needham & Associates</i>	<i>Lump Sum</i>	<i>(3%-6%) Construction Budget</i>
<i>Ryan Companies-Bell Land Improvements (Excavation)</i>	<i>Lump Sum</i>	<i>\$ 1,610,566</i>
<i>Ryan Companies-Lejeune Steel</i>	<i>Lump Sum</i>	<i>\$ 4,524,000</i>
<i>Ryan Companies-Spancrete (Pre-cast Superstructure)</i>	<i>Lump Sum</i>	<i>\$ 4,318,537</i>
<i>Ryan Companies-Elliot Concrete (Foundation/ Substructure)</i>	<i>Lump Sum/ Unit Price</i>	<i>\$ 2,105,760 (add) Unit Price Contract for Composite Tie-backs \$ 364,000</i>
		<i>\$ 2,469,760</i>
<i>Ryan Companies-Sebert (Land Development)</i>	<i>Lump Sum</i>	<i>\$ 560,539</i>
<i>Ryan Companies-Oakbrook Mechanical</i>	<i>Lump Sum</i>	<i>\$ 4,258,000 (less “VE”) (\$ 585,900)</i>
		<i>\$ 3,672,100</i>
<i>Ryan Companies-Hyre Electric</i>	<i>Lump Sum</i>	<i>\$ 4,567,627</i>
<i>Ryan Companies-Ewing Doherty</i>	<i>Lump Sum</i>	<i>\$ 921,455</i>



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<i>(Plumbing)</i>		
CCO-RYAN -Southern Bleacher Company	Lump Sum	“Tabulated from Cumulated Arena Data”
Ryan Companies-CIMCO	Lump Sum	\$ 800,000
CCO-RYAN-Arena Concessions	D/B Allowance	“Tabulated from Cumulated Arena Data”
CCO-RYAN-Arena Systems	D/B Allowance	“Tabulated from Cumulated Arena Data”
Total Arrangement		Running Total
		<u>Construction Building Cost (Σ)</u>
		\$ 47,600,000

Construction Cost:
(Probable Operations) and Building Maintenance Cost: (Arena Bowl HVAC Units)
Budget Comparisons (Current Budget vs. Budget with Life Cycle Upgrades)

Construction Budget		
<u>Tasks</u>	<u>Budget</u>	<u>“VE” Costs Add effects</u>
Demolition	\$ 0	
Utilities	\$ 8,000	
Excavation/ Found.	\$ 2,545,000	→ (\$ 28,893)
Superstructure	\$ 7,855,000	
Roofing Waterproof.	\$ 430,000	
Envelope Sys.	\$ 2,246,000	→ (\$ 19,042)
Int. Finishes	\$ 5,970,000	
FF&E	\$ 577,000	
Scoreboard	\$ 1,258,000	
Ice Floor Package	\$ 803,000	→ (\$ 26,000)
Equipment	\$ 721,000	
Food Svc.	\$ 1,605,000	
Seating	\$ 1,103,000	
Vert. Transportation	\$ 598,000	
Plumbing	\$ 1,148,000	
Fire Protection	\$ 368,000	
HVAC	\$ 3,325,000	
Elect.	\$ 3,777,000	
Audio/ Visual Sys.	\$ 779,000	
Plaza and Site	\$ 549,000	
Σ Total w/ Soft Costs	\$ 47,420,000	Less (\$ 73,935) = \$ 47,346,065



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Project Sourcing:

Project Sourcing for large scale sports recreation and concert facilities can be provided from a myriad of sources. However three sources that have been successful in recently arena development are (1) “P³” Public-Private-Partnerships, (2) Private Donor Funding (*Typical of an Association/ Endowment Fund*) and (3) Commercial Construction Loans (*Lender to Designee Relationship*). Funding for the Sears Centre is provided by Option # 3, which is a commercial loan structure that is fairly similar to a mortgage. This arrangement is widely used for construction projects ranging from sports facilities and other commercial properties. However alternative project funding is available for projects that can be classified as potential assets and incentives to local municipalities. Ultimately the goal of the CCO entertainment is to provide this type of development to townships and municipalities throughout the US. The irony exists in the classification of the property. CCO will endeavor to keep the property as a private asset using the delivery principals typically seen on fully or partially funded gov’t projects. As a result an incentive structure program will be difficult to implement. One other inherent difficulty in project funding is the ability to obtain an inexpensive loan for a plan proto-type. Prototypes contain elevated risks associated with process inexperience. To counter act risks, increased interest rates will be used in annuity payments for the duration of the loan payback/ leaseback period.

Payment Methods:

Commercial Construction Loan Payment Terms

Most Commercial construction loans have a 20-30 yr payback period, valued at 70% - 100% of construction cost.

Cost Method Assessment – Mortgage/Commercial Loan Repayment Calculator:

(Loan & Financing Terms)

<i>Key Terms to Commercial Construction Loan and Financial Sources</i>	
<i>\$/r Interest Rate</i>	<i>Interest is the amount paid for the use of money for a certain time. Although interest rate is typically quoted as a yearly figure, the actual amount of interest paid per year can be more, depending on the compounding period</i>
<i>(t) Compounding</i>	<i>Compounding is about interest on interest. When the interest is added to the principal to generate further interest, the interest is said to be compounded and the frequency this happens is called the compounding period. Interest can be compounded yearly, monthly, weekly, or even continuously.</i>
<i>Points</i>	<i>Points are one of the ways for lenders to cover the costs of processing the loan. Quoted as a percentage number, this is the amount added to the principal of the loan. For example, if you borrow \$100,000 with 2 points, you owe \$102,000 the moment you receive your \$100,000 loan. This is generally accepted in return for a</i>



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	<i>favorable interest rate.</i>
<i>\$/r APR</i>	<i>Loans sometimes involve additional cost such as points and other fees, which vary from lender to lender. In order to compares loans, one should use the Annual Percentage Rate, the equivalent interest rate after all the added cost being considered.</i>
<i>\$/r Annuity</i>	<i>A fixed annuity is a fixed amount paid at regular intervals. In spite of its name, this interval does not have to be a year. Also the amounts may be variable, in which case it is called a variable annuity.</i>
<i>\$ Money Value</i>	<i>A term not typically used in commercial/ land development loaning. Under typical leasing terms, the interest rate can be approximated by the money factor multiplied by 24. When a dealer quotes a money factor k, the customer should have the confidence of knowing that they are receiving a rate slightly better (lower) than 2400 k %.</i>
<i>(LIBOR) Interest Rate</i>	<i>Libor is short for the London International Bank Offered Rate, the interest rate offered for US dollar deposits by a group of large London Banks. Rates are quoted for (1-month), (6-month) and (12-month deposits) Drawback is that a LIBOR Rate is an (AMR) – Adjustable Mortgage Rate, for this example LIBOR rates will be used as fixed rates during the course of the commercial loan, however for ideal situations commercial loans with interest rate evaluation longer than the (1), (3), (6) or (12) month durations will be used.</i>
<i>“T-Note/ T-Bond” Treasury Note</i>	<p><i>Treasury notes, sometimes called T-Notes, earn a fixed rate of interest every six months until maturity. Notes are issued in terms of 2, 3, 5, and 10 years.</i></p> <p><i>Treasury bills, or T-bills, are sold in terms ranging from a few days to 26 weeks. Bills are sold at a discount from their face value. For instance, you might pay \$970 for a \$1,000 bill. When the bill matures, you would be paid \$1,000. The difference between the purchase price and face value is interest.</i></p> <p><i>The U.S. Treasury resumed issuance of Treasury bonds with a 30-year bond auctioned in February 2006. The next auction is scheduled for August 2006.</i></p> <ol style="list-style-type: none"> <i>1. Treasury Bills have maturities of one year or less.</i> <i>2. Treasury Notes have maturities of two to ten years.</i> <i>3. Treasury Bonds have maturities greater than ten years.</i>



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Note: (bps = BPP is 0.01% of 1 percentage point) "237 bps/ 100 = 2.37% or 0.0237

Mortgage Rate(s) provide by Bankrate.com (Bloomberg Finance)					
Rates given as percentages (%)	Current (includes BPP)	(1) Month Prior	(3) Month Prior	(6) Month Prior	(1) Year Prior
15-Yr Mortgage	5.57	5.46	5.34	4.90	5.10
30-Yr Mortgage	5.88	5.81	5.74	5.34	5.52
1-Year ARM	4.89	4.61	4.52	3.95	3.82

Current Value of \$ Money	
Indicator	Interest Value
Prime Rate	7.50
30 Year T-Bond	4.70
10-Yr Note	4.66
91 Day T-Bill	4.53
Fed Funds	4.55
12 Month LIBOR	4.94
30 Yr Mortgage	6.24



Loan Program: Executive (II) Program

Loan Use:

- (1) Most Commercial Acquisition
- (2) Commercial Refinance

Loan Value:

❖ \$ 5,000,000 to \$ 50,000,000⁽¹⁾

Loan (%) Up to:

Up to (80%) of Costs

Interest Rate:

10-Yr T-Note + $_{[114 - 237 \text{ BPP(s)}]}$ ⁽²⁾

Index Type:

Treasury Note 10 (yrs)

Index Rate:

4.66 % + $_{(114-237)/100}$

Loan Term:

15, 20 & 25 year period

Amortization Schedule:

15 to 30 years

Loan Program: Large Private Placement Program

Loan Use:

- (1) Commercial Acquisition
- (2) Commercial Refinance
- (3) Commercial Development

Loan Value:

\$ 20,000,000 to unlimited⁽⁷⁾

Loan (%) Up to:

(70 %) to (100 %) of Costs

Interest Rate:

30-Yr T-Note + $_{[150 - 300 \text{ BPP(s)}]}$ ⁽⁴⁾

Index Type:

Treasury Note 30 (yrs)

Index Rate:

4.70 % + $_{(150-300)/100}$

Loan Term:

10 year period⁽⁶⁾

Amortization Schedule:

15 to 30 years

Reference Notes:

- (1) Maximum loan amount based upon appraised value established by approved MAI appraisal, which will be at owner's or buyer's expense, and/or the DSCR.
- (2) Fixed and Floating Rate Loans are available. Spread will vary with Loan Program. Rates are effective at the time of rate lock-in.
- (3) Appraisal and DSCR can affect whether the maximum loan available.
- (4) Low Fixed Rate depending on market conditions at time of rate lock-in.
- (5) Mortgagor required to prepay first year's mortgage insurance at closing. Gross loan amount will be predicated upon 90% of cost or 1.10 DSCR as established by Insurer.
- (6) The loan has a balloon payment due at the end of the term.
- (7) The loan amount can be lower with a conventional amortization schedule and will be determined on a case-by-case basis.
- (8) An Interest Only Loan, Valuation of Property, Paid in Cash Equity, and Rent Roll are prime determining factors for loan.
- (9) The Combined Loan to Value (CLTV=First Lien and Mezzanine Loan) cannot exceed as indicated. The Mezzanine Loan may require backend payments, and lockout period.



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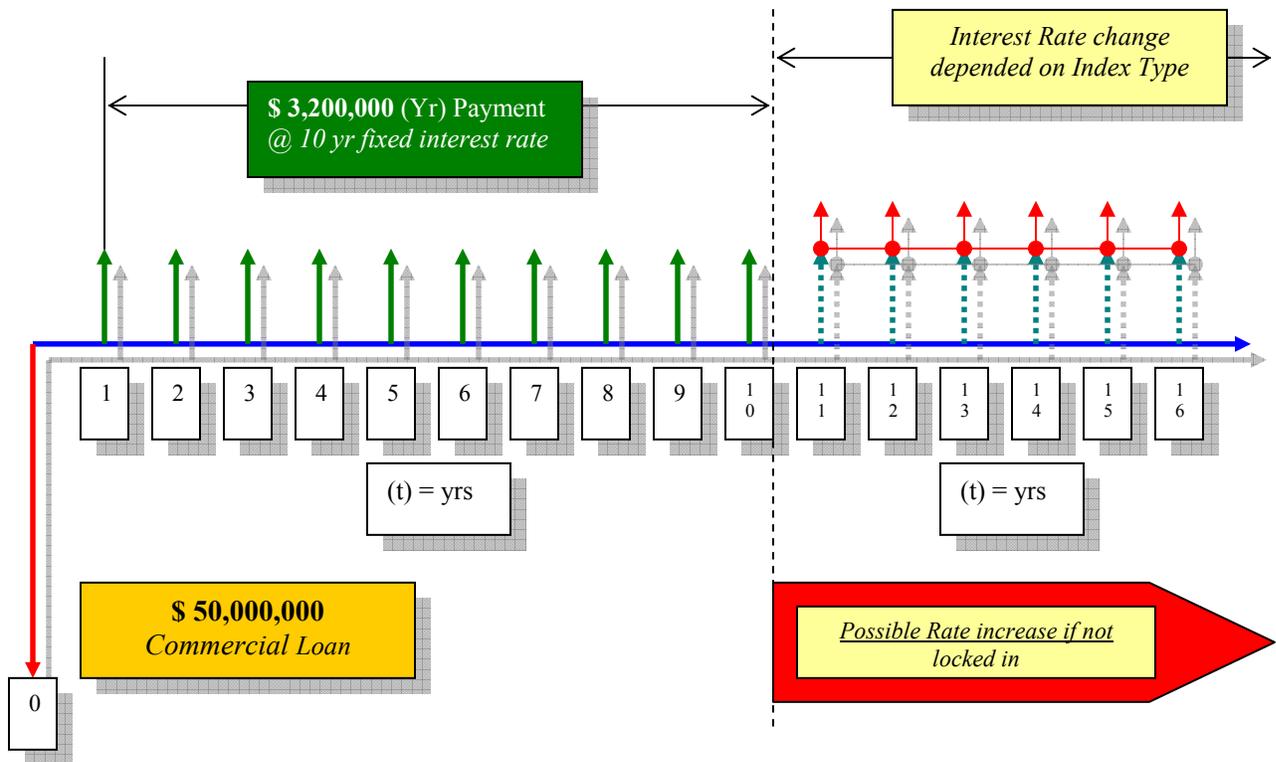
$$\text{Rate Repayment} = \frac{(\text{PLA}') * [1 - (\text{IR} + \text{BPP})^{(\text{NPS})}] * (\text{IR} + \text{BPP})}{[1 - (\text{IR} + \text{BPP})^{(\text{NPS})}] - 1}$$

(t) = time cycle

Using a rate calculation with a 30-yr mortgage 5.88% interest rate generated the following loan repayment rate for the Sears Centre property:

- ❖ \$ 258,779.12 / mo. ➔ **\$ 260,000 / month**
- ❖ \$ 3,119,206.73/ yr. **\$ 3,200,000 / yr.**

Fixed Annuity Re-payment curve @ one 10-yr cycle:

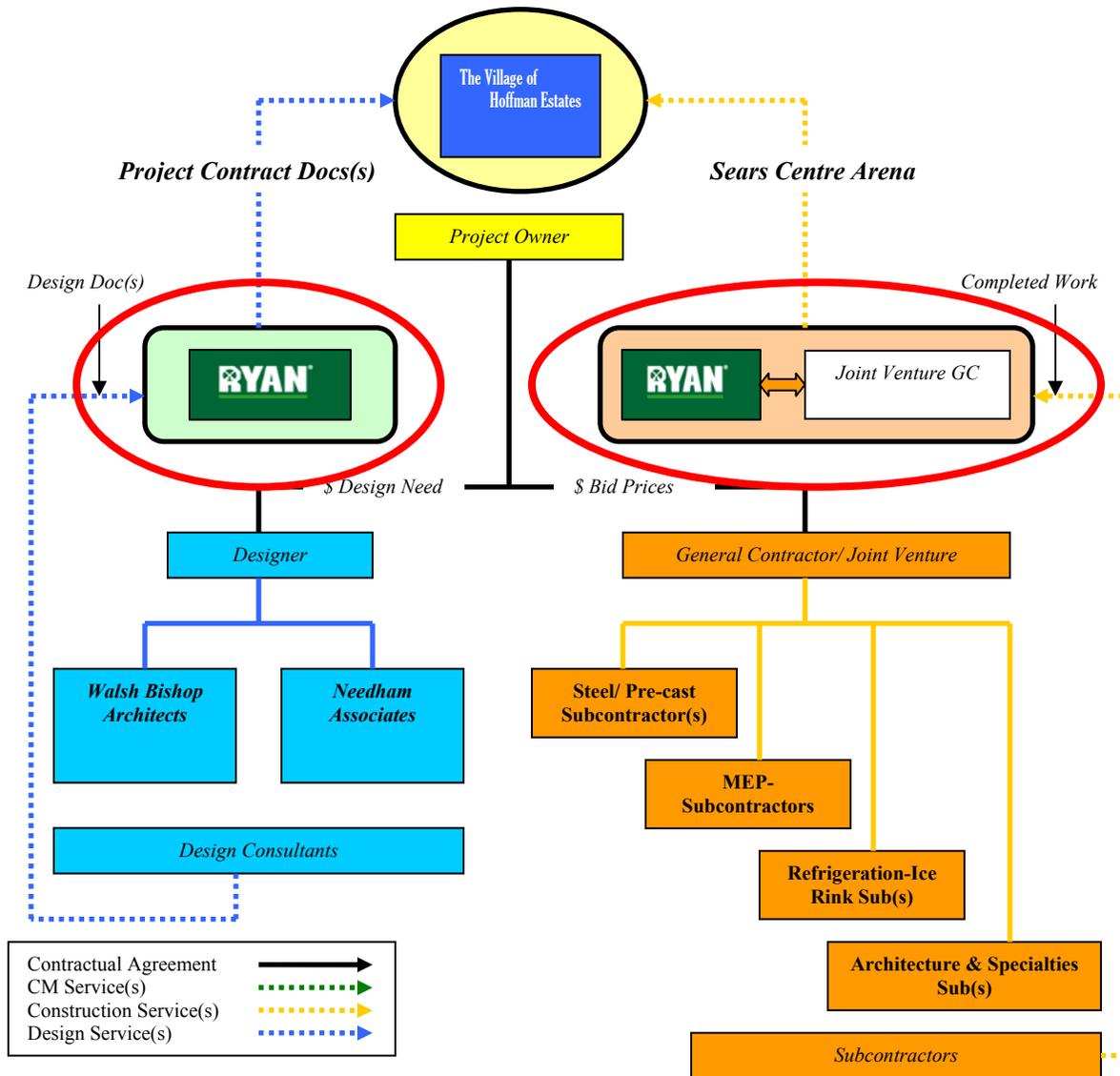




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Brief Summarization of PDS Alternatives

Traditional-Design/Bid/Build (TRAD/DBB) / Alternative #1 (20% of Ryan Companies PDS)



Analysis of Delivery for Sears Centre Project

- ❖ The traditional delivery method or Design-Bid-Build method typically involves (3) primary project participants. (1) Project Owner (2) A-E (Designer) and (3) General Contractor. The frame work for this arrangement is centered heavily on owner/ designer relationships. Design Entities are typically brought to the project at a relatively early stage of the project. Through this project development stage, a



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building program is first established based on owner's needs and wants. Owners will hold (1) of the (2) primary contracts with the (A-E). This contract will cover all design development fees prior to any project construction or contractor selection. Design fees typically fall in one of three categories:

Typical Design fee payment types:

- ❖ *-\$ (%) -of-anticipated Construction Cost*
- ❖ *-\$ Designer's Lump Sum*
- ❖ *-\$ Negotiated Reimbursement Rate typically (4% to 15%)*

Typical Design Services Provided in Arrangement:

- ❖ *Building Programming*
- ❖ *Conceptual Design*
- ❖ *Design Progression Services*
- ❖ *Base Project Estimate and*
- ❖ *Complete Drawings w/ Specifications*
- ❖ *Contractor Recommendations/ Hard Bid Situation*
- ❖ *Legal Commitment to owner's Risk*

When complete drawings are produced a General Contractor is selected to administer all construction directives based on complete drawing documents. The arrangement consist of the (2) project contract between the owner and the general contractor. No formal contract exists between contractor and designer, despite encouragement by the owner for "project cohesion".

Typical design fee payment types:

- ❖ *-\$ Payment consistent with contract type- typically 'Unit Prices' work best for this arrangement since known quantities are expected*
- ❖ *-\$ Construction cost percentage of total units installed at an established rate.*

Typical Design Services Provided in Arrangement:

- ❖ *Building Permitting Acquisition & Cost*
- ❖ *Builders Risk and other pertinent insurance provisions*
- ❖ *Appropriate Bonding Capacities*

(Sears Centre) Advantage(s) for using PDS on Project:

Advantage for Contractor:

- ❖ *Level of complexity due to insufficient information directly related to incomplete design. Established quantities create ease of procurement and coordination from information standpoint.*

Advantage for Owner:



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- ❖ *Village has direct control and input in the design schemes. (A-E) Firm will offer direct assistance in contractor selection via legal contract for consultation services.*

(Sears Centre) Disadvantage(s) for using PDS on Project:

Disadvantage for Contractor:

- ❖ *Contractor must be “well-versed” in handling a project of this type since reputation will be depended on how well contractor can adjust to prices and time frames set forth by the owner strictly from (A-E) in-put. Price tends to be expected to be met with (A-E/ Owner) related calculations not local escalation which can be costly on a job of this type and size. “Possible adversarial relationships with Contractor and (A-E) professional. “Turnkey” operations, operations which meld design with construction, are the major premise for this delivery system.*

Disadvantage for Owner:

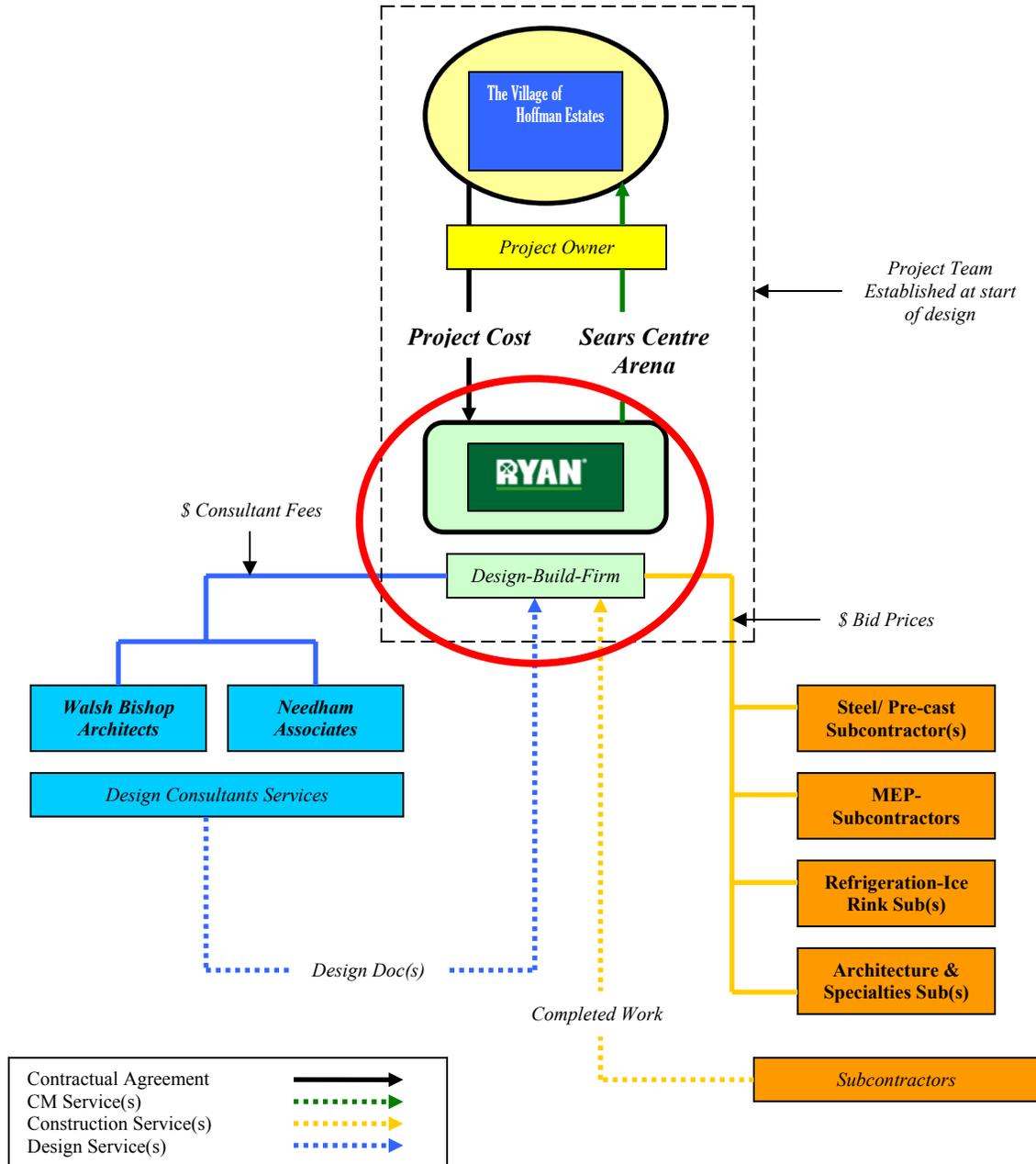
- ❖ *Although owner is solely responsible for the Design and General Construction contracts, design and construction collaboration may be time consuming and “One-sided” on a project of this type and size. Due to the importance of time and cost constructability concerns will have a substantial impact on meeting the required date within the fixed budget. Traditional method doesn’t adhere well to inherent project constraints.*



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Design Build (DB) – (“Current Project PDS”) | Current Option accounts for 80% of Ryan Companies projects preferred method



Analysis of Delivery for Sears Centre Project

- ❖ Design-build relationships are well suited for entities who have gained experience in the local market via-(Design/Construction) process and subcontractor reputation. Essentially the owner will issue a “master contract” with a firm which specializes in design development and construction in “niche-markets.” The major



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point behind the arrangement is the internal emphasis on “fast-tracking”, inside constructability review and procurement acceleration. “Turnkey” operations, operations which meld design with construction, are the major premise for this delivery system. Design Build entity may exist as a single form or” Joint Venture” collaboration strictly for the purpose of completing the project.

Typical (DB) Design-Build contract payment types:

- ❖ -\$ GMAX, GMP Guaranteed Maximum Price
- ❖ -\$ Negotiated Contract Reimbursable

Typical Design-Build Services Provided in Arrangement:

Once Source Entity for the following:

- ❖ Pre-construction Services
- ❖ Feasibility Studies
- ❖ Reality Checks
- ❖ Project Financing
- ❖ Land Procurement and acquisition/ Long Lead Item Identification and procurement
- ❖ Plan Conception and Design
- ❖ Cost Estimating and Cost Accountability
- ❖ In-house constructability reviews
- ❖ Construction Process Management and Contractor Selection

(Sears Centre) Advantage(s) for using PDS on Project:

Advantage for Design-Build Entity:

- ❖ (DB) Entity is in partnership with owner for project profitability, a “client-based relationship exists.” Since this method is preferred for complex projects with strict specifications, the method is a probable PDS for this situation. Entity will have more control and persuasion in conceptualized designs. Constructability issues can be merged with design concerns and remedied up front rather than later.

Advantage for Owner:

- ❖ Fast-tracking is typically embedded in project delivery. Due to entity specialization, project design, construction and subcontractor collaboration are handled by one-source. Like most projects with this PDS, the (DB) is legally bound to provide the project at the agreed upon cost despite errors, omissions and unforeseen conditions. *(If escalation isn't brought to the negotiating table early individual cost increases become the responsibility of the DB-Entity w/o debate.)*



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(Sears Centre) Disadvantage(s) for using PDS on Project:

Disadvantage for Design-Build Entity:

- ❖ *(DB) entity assumes all responsibilities related to design and construction. Since firm or joint venture is hired before the design is complete real pricing is difficult to establish. In addition to the pre-construction services provided by the entity, design-cost proposal are typically asked up front. One of the inherent difficult with the Sears Centre is that during the competitive bidding portion of subcontractor selection unit prices weren't finalize which made accurate unit prices difficult to obtain. Lump Sum Contracts were issued to major structural steel and concrete subcontractors without direct unit prices. Issues similar to these make fast tracking and best value prices difficult but not impossible to obtain.*

Disadvantage for Owner:

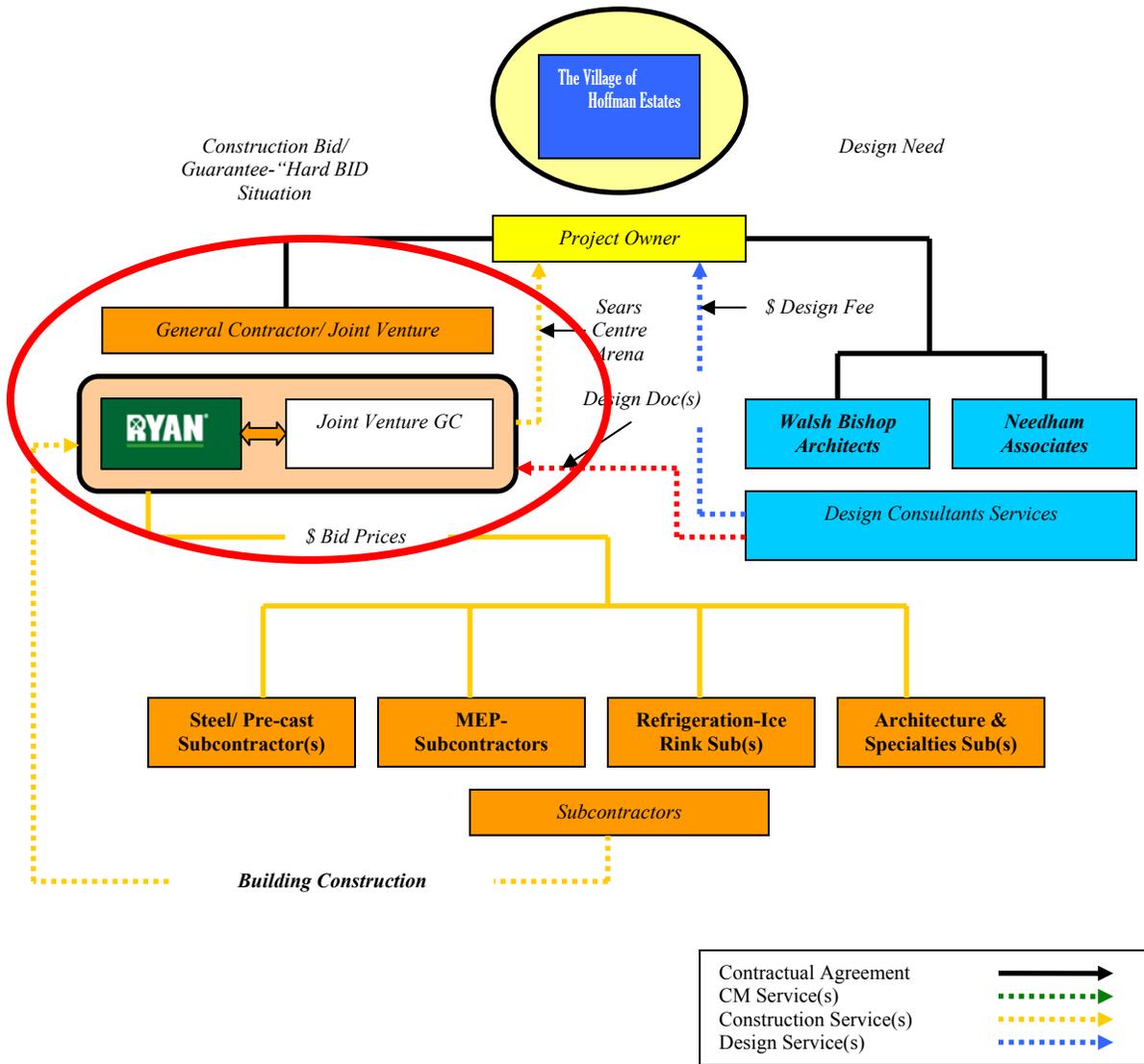
- ❖ *Lack of firm pricing can lead to sacrifice of quality for the sake of budgeting. Since one source provides pre-con/ construction and design, an accurate system of checks and balances may not exist, as consultation for construction and design come from one source or opinion.*

(However for this project since Ryan Companies has focused its business on 80% Design Build; this method by default was selected for the establishment of this planned prototype.)



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Construction Manager at Risk CM@R / Alternative #3



Analysis of Delivery for Sears Centre Project

- ❖ Similar to Design Build in its approach to project cohesion with design and construction, this method specifies responsibility to each party for their respected area of expertise. A general contractor/ construction manager is bought into the project early to offer constructability with design reviews. Once constructability issues have been resolve with designs, plans are finalized for firm pricing and project management. Design and Construction contracts are held by the owner, in this case the Village of Hoffman Estates. Master cont
- ❖ Three “tiered” difference from Design-Build Approach



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1. Management of construction process w/ inclusion of sub-contractor selection (GC/CM) holds performance contracts with sub(s) and vendors
2. Design and construction overlapping with emphasis on expediting the delivery process (Incorporation of constructability review)
3. (QC)-Quality Control, Construction Cost Estimation for GMAX potential and project scheduling.

Typical Design fee payment types:

- ❖ Similar to that of a Design-Bid-Build/ Traditional Delivery Module

Typical GC/CM contract suitable for PDS types:

- ❖ -\$ GMP
- ❖ -\$ Reimbursable Contract at Negotiate Rate

Typical Design-Build Services Provided in Arrangement:

Two Source Entities for the following:

- ❖ Pre-construction Services
- ❖ Feasibility Studies
- ❖ Reality Checks
- ❖ Project Financing
- ❖ Land Procurement and acquisition/ Long Lead Item Identification and procurement
- ❖ Plan Conception and Design
- ❖ Cost Estimating and Cost Accountability
- ❖ In-house constructability reviews
- ❖ Construction Process Management and Contractor Selection

(Sears Centre) Advantage(s) for using PDS on Project:

Advantage for Builder in CM @ Risk Arrangement:

- ❖ Builders who specialize in this arrange are privy to a level of knowledge obtained via past experienced on specialized projects. Like Design-Build, entities have developed a niche market for complex projects that require this method as a preferred PDS. In this arrangement the builder will have ample opportunity to shape the project constructability in design. Arrangement may encourage value engineering suggestions and cost realizations since emphasis on pre-construction services are treated with equal importance as actual construction. A project of this type and complexity will require the CM/GC to have an intricate network of procurement strategies not only for long lead items but large scale common quantities as well.
- ❖ Overall GC/CM benefit – project unknowns brought to forefront via design-constructability reviews and active CM quantity pricing.



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Advantage for Builder in CM @ Risk Arrangement:

- ❖ Project owner has the benefit of collaborative analyses from design and construction professional. The structure of the system has inherent checks and balancing. (CM) and (A-E) professional have an opportunity for direct contact prior to construction start and design document finalization.
- ❖ In most cases the owner has a representative with intense construction, schedule and cost accounting knowledge especially for procurement concerns. When cost is the precedent over time for complex project this is a viable solution.



(Direction of Checks and Balance)

- ❖ (CM) Accurate Pricing/ Design Specified Material
- ❖ (CM) Project Time-Frame Analysis with up to date information
- ❖ Best Value Assessment



(Direction of Checks and Balance)

- ❖ (A-E) CM/GC Specialization Qualification If requested by owner

(Sears Centre) Disadvantage(s) for using PDS on Project:

Disadvantage for Builder in CM @ Risk Arrangement:

- ❖ Success of this PDS depends on the level of knowledge owner has in detailed project workings. Premise of delivery system is (1) communication (2) owner involvement and (3) coordination during the pre-construction and construction stage. Unlike the Design-Build, meshing constructability and design changes can be time consuming and cumbersome, due to the fact that two independent sources are involved in the construction design process. Potential for adversarial relationship may develop when a product or process of equivalent/ compatible



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Construction Management*

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quality can be provided at a lower cost via CM-GC knowledge contrary to content specified in design documents.

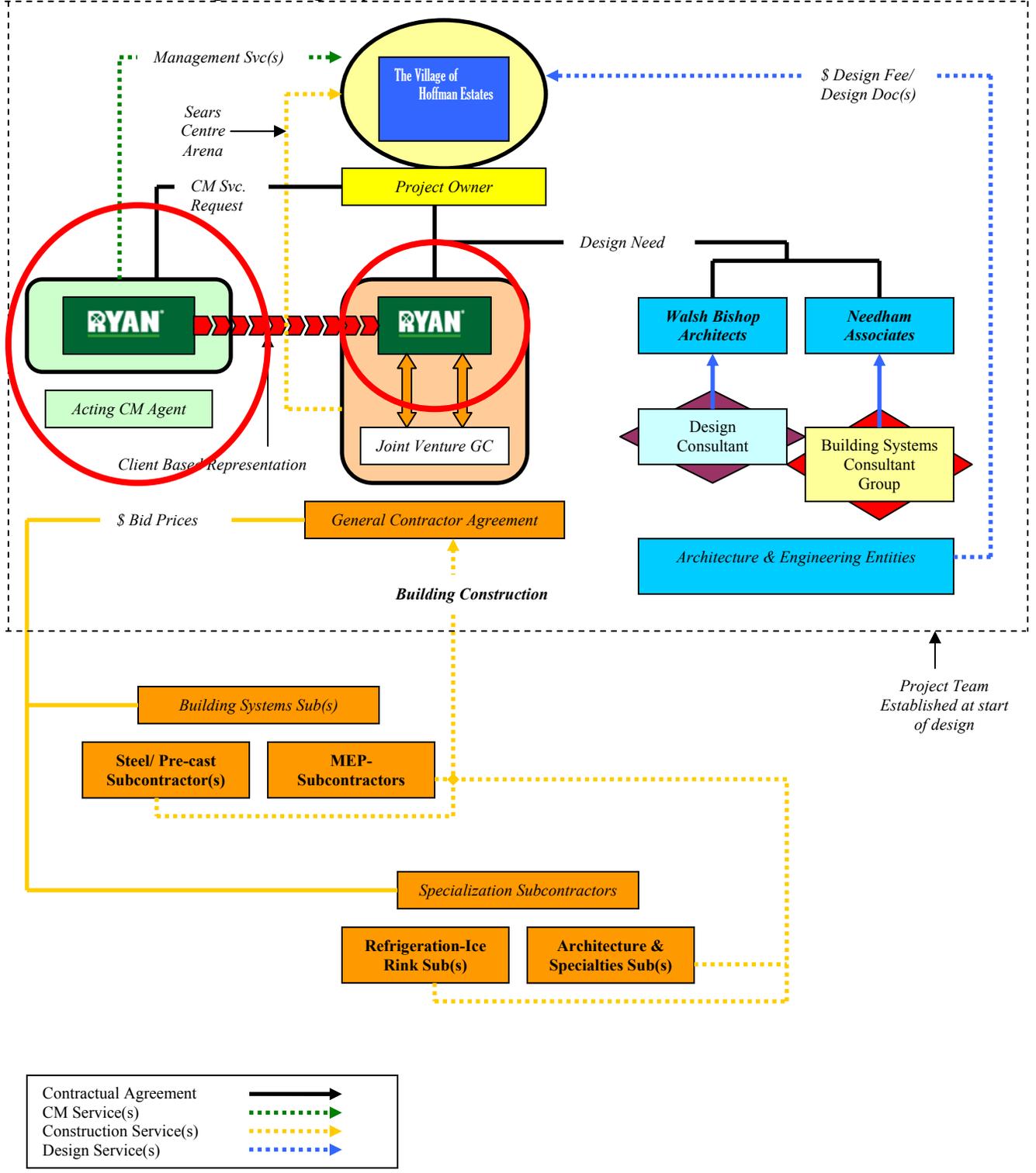
Disadvantage for Owner in CM @ Risk Arrangement:

- ❖ *Although a valid system of “Checks & Balances” is established here to fill the void contain in the Design-Build delivery method, time factored changes can cause substantial delays if not communicated properly from Owner. Owner has to assume more responsibility in managing primary project relationships between (A-E) and CM.*
- ❖ *“Value Engineering = Cost Cutting/ Profit Protection” can be slightly difficult to detect in this setting.*



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Construction Management Agency CMA / Alternative #4





Analysis of Delivery for Sears Centre Project

Delivery system has Construction Management entity acting in the order of the owner's representative and cost control function for project. Owner will handle multiple contracts (1) Contract with Architect and Design Services (2) General Construction Contract and (3) Construction Management Contract for owner representation. Interesting aspects to note are: project complexity and builder experienced Contract (2) and Contract (3) can be rolled into one package delivery to create a system similar to CM@R. Experienced owners have utilized this system to obtain "Best Value" processes. A trade off for consultation fee(s) and staffing overhead is usually present in this arrangement to help experienced owners manage GC(s). Project team is initialized during the conceptual, design or procurement phase of the project. CMA will most likely help projects with critical procurement issues.

"Related entities typically do not specialize in above method. All though method reduces procurement issues and preserves inherent checks and balances, potential of cost increase to project is high in addition to ownership-(Village of Hoffman Estates) is limited for managing construction and design contracts of this type."

Typical Design fee payment types:

- ❖ *-\$ (%) -of-anticipated Construction Cost*

Typical GC/CM contract suitable for PDS types:

- ❖ *-\$ Unit Cost*
- ❖ *-\$ Lump Sum/ Fixed Price*

Typical Design-Build Services Provided in Arrangement:

- ❖ *Cost Checks*
- ❖ *Plan Check Services*
- ❖ *General Contractor(s) and Trade Management Services*
- ❖ *Project Scheduling*
- ❖ *Submittal Reviews*
- ❖ *Procurement Solutions*

(Sears Centre) Advantage(s) for using PDS on Project:

Advantage(s) to Sears Centre Pre-construction/ Construction Process:

- ❖ *"Fewer Quantity Bust"*
- ❖ *Clear Roles Widely Accepted*
- ❖ *Process is well established and universally understood; responsibility of project communication is taken off of the "shoulders" of the owner and taken up by the CM Agent.*



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- ❖ *Owner specifies define requirement and has some knowledge of the desired construction process*
- ❖ *Fixed Price Changes/ Potential Reduction in Change Orders*
- ❖ *Fiduciary Responsibility of Agent lies with owner for project and process advancement*
- ❖ *Joint collaboration between (1) or (2) experienced Prime Contractors who specialize in services*

(Sears Centre) Disadvantage(s) for using PDS on Project:

Disadvantage(s) to Sears Centre Pre-construction/ Construction Process:

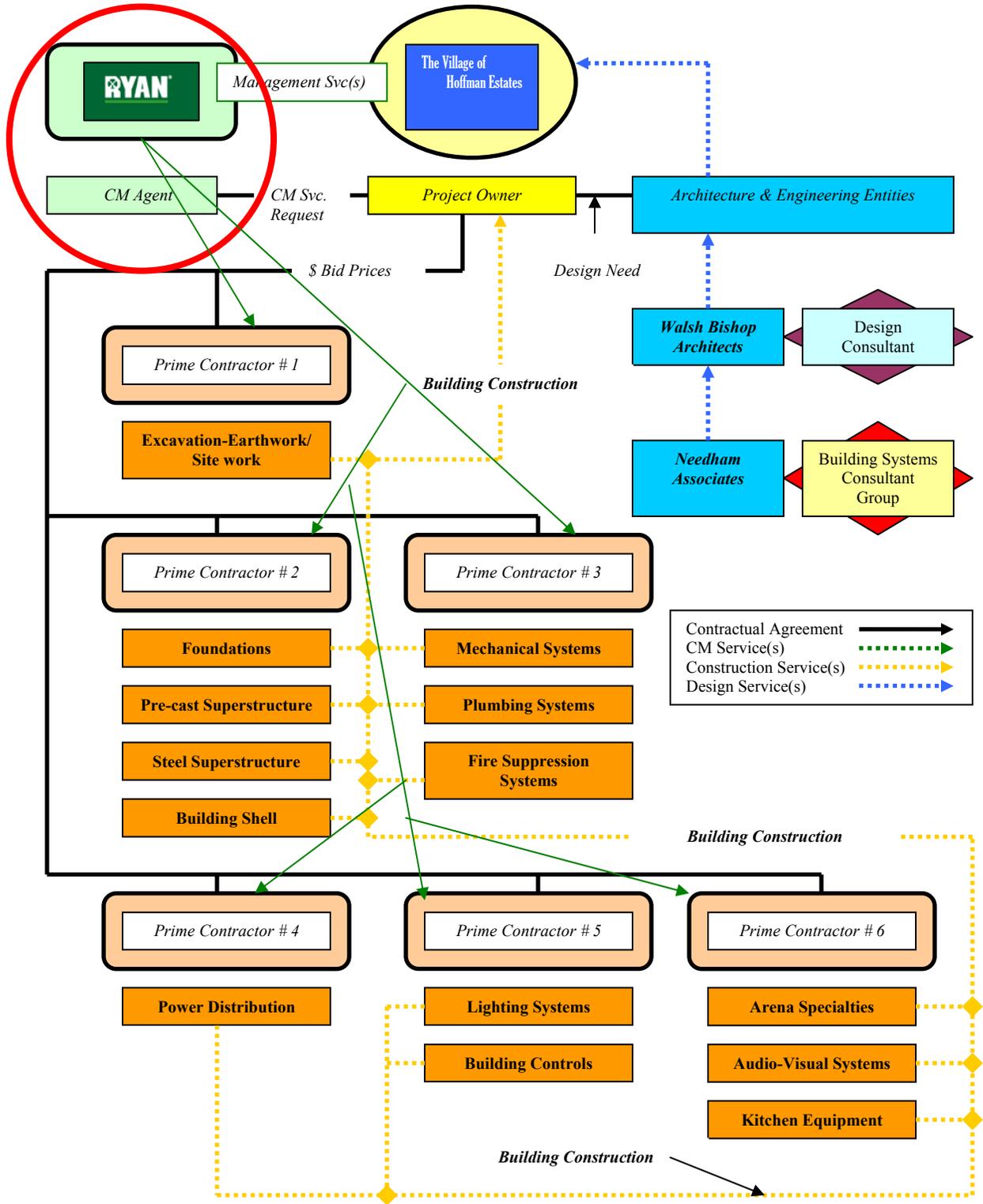
- ❖ *Cost of change order(s) increase due to time frame and previously implied cost controls*
- ❖ *Unforeseen adjustments and late scope changes can add to elevated design and overhead cost*
- ❖ *Construction typically starts after design is completed*
- ❖ *Design may lack constructability due to lack of contractor input*
- ❖ *Since cost is the precedent quality may be sacrificed for delivery*



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Multiple Prime (MP)/ Multiple Prime w/ CM Agency/ Alternative #5





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Analysis of Delivery for Sears Centre Project

Project structure for this delivery method is complex and relies on interactive owners who have experience in process management. A multi-prime (separate prime) arrangement involves multiple contracts between and owner and the major project participants. Like the (DB), (CM@R), (CMA) method the owner hires design and construction entities separately. Method is extremely useful where “phase occupancy” is a requirement and prescribed building and systems costs are elevated. To reiterate, the success of this method depends solely on owner’s expertise in process management and communication flow. Large scale jobs or high profile projects, contract management directly impacts cost controls and overruns, as a result the multiple-prime with CM Agent arrangement has been introduced to the industry. Projects that are owned by large corporations or depend on agency funding typically use this arrangement to reach the most inexpensive \$ cost per building system package.

“Although many universities, hospital systems use the MPA hybrid (Multiple Prime-CM Agent arrangement) for facilities, approach typically doesn’t work in arena construction due to lack of coordination among primes. Phase occupancy is a non-existing requirement for Sports Facilities and Concert Centers.”

Typical Design fee payment types:

- ❖ -\$ (%)-of-anticipated Construction Cost

Typical GC/CM contract suitable for PDS types:

- ❖ -\$ Contract types should be uniform unless approved by owner for cost savings or time benefits
- ❖ -\$ Unit Price contracts may work best in this arrangement due to known quantities for separate packages

Typical Design-Build Services Provided in Arrangement:

- ❖ Provided by owner / architect or acquired agent since owner assumes the responsibility of the “Master-Contractor”
- ❖ Multiple Primes follow a “Plan & Spec” method for building systems delivery

(Sears Centre) Advantage(s) for using PDS on Project:

Advantage(s) to Sears Centre Pre-construction/ Construction Process:

- ❖ Reduction or elimination of GC market-up
- ❖ Can obtain best price for unit cost structure
- ❖ Can be lucrative for Owner Controlled Insurance Policy (OCIP(s))

(Sears Centre) Disadvantage(s) for using PDS on Project:

Disadvantage(s) to Sears Centre Pre-construction/ Construction Process:



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- ❖ *Additional responsibility placed on owner for contract coordination and risk obligations*
- ❖ *Bonded Prices for project may cause some concern for owner*
- ❖ *Ambiguity of Final Construction Cost of Project*
- ❖ *Minimum incentive for increase in construction management fee (Owner Related)*
- ❖ *Third party liable a concern with multiple contractors*

Brief Summarization of Contract Alternatives

Cost-Plus-Fee/ Reimbursable Contract Structure:

The predecessor of a GMP/ GMAX structure, when a Cost-Plus-Fee arrangement is used the owner determines a fixed sum which may not be appropriate or desirable for project. Contract is usually administer between owner and contractor, although designer may be reimbursed in a similar manner for rendered services. Majority of contracts issued in this structure are open-ended based on preliminary documents and specifications solely for the purpose of arriving at a “targeted estimate.” Once produced, a scope contract is executed between owner and general contractor. Although the contract structure affords the (GC) the opportunity to (1) impact the shape and depth of the scope with little input from design (2) In list the possibility of (GC) to generate extra profit for additional pre-construction services and (3) grants fast-tracking and value engineering opportunities for project, attention must be paid to exactly what reimbursements the (GC) and designer are entitled to. Any service provided beyond contract stipulations is at cost to designer/ (GC).

Key Concerns issues and factors with contract:

- ❖ Experience of (GC) relied on heavily to provide assume ceiling and reimbursement
- ❖ Owner must be careful that services render warrant costs on the account of both design and construction

Guaranteed Maximum Price/ GMP Contract Structure:

Contract is a variation of a ‘Cost plus Fee Arrangement’. Occurrence which warrant contract use are projects with complex scopes which have budgets that can not accurately be determine pre-construction completion. A price ceiling or maximum price is established to counter-act and control upfront costs. Commonly referred as the “upset cost” the maximum price is one of the conditions which separate this arrangement from a Lump Sum structure. Flexibility for project completion and scope resolution only exist beneath the GMP. When determining “contractor upset costs”, owners must be careful not to solely base expectations on in house estimates, drawings and specifications. In order to accurately estimate a complex project with this method, owners must jointly reference complete drawings and specifications, consultative intuition and cost escalation, which may be considerable for high profile projects such as recreational



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facilities. Any incurred overage beyond the established price is the responsibility of the contractor dispute level of scope complexity.

Key Concerns issues and factors with contract:

- ❖ “Iron cladding a contract establishes a maximum cost ceiling that doesn’t entitled contractor reimbursement if breached.”
- ❖ $\sum \$ \text{Total Construction Cost}_{(\text{Max Cost})} < \$ \text{Owner imposed "Upset Cost"}_{(\text{GMAX/GMP})}$
- ❖ Incentive dispersions to contractor ,owner or % split
- ❖ Costs “caps” may influence sacrifice of scope and quality
- ❖ With GMP- Watch for “cost cap” can be inversely effective to overall quality of scope
- ❖ Without GMP- Watch for schedule increases in low of quality schedules

Lump Sum/ “Fixed Price” Contract Structure:

This particular contract is a relative straight forward “fixed cost arrangement.” Unlike the previous contract, project unknowns are reduced to a minimum before contract implementation. Arrangement is popular with projects of defined scopes. As a side note “fixed price” agreements are usually used for contractors/ subcontractors who have very little influence on project design and have agreed to the terms of the owner for provision of scope within the contract.

Key Concerns issues and factors with contract:

- ❖ Fixed sum for performance of stipulated job – (Very little chance for contractor cost incentives)
- ❖ Construction difficulties/ costs overruns can only be addressed via relief(s) and remedies in contract clauses
- ❖ Contract as “master contract” is suitable for building construction
- ❖ Contract as “master contract” not suitable for operational components

Unit Cost/Price Contract Structure:

Basis behind contract forms the basis for an estimate completed before any contract release. Designer initially performs an estimated scope with typical quantity costs [$\$/ \text{SF}$, $\$/ \text{LF}$, $\$/ \text{CY}$, $\$/ \text{ton(s)}$]. Once defined costs are conveyed to owner, bid documents are released in a “hard bid” situation. Contract works best for typical projects which have been completed on repetitive bases, also for subsystems on jobs where know quantities are essential, such as foundation systems, scaffolding and shoring components. When executed properly, with some flexibility for direct contractor influence (i.e. reasonable bid floor adjustment), contract can be bid and implemented electronic via pro-log or expedition.

Key Concern issues and factors with contract:



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- ❖ Owner must account for escalation, local taxes and market available as a baseline for accurate accounting even if bidders don't specify cost measures have already been included in bid

For a project of this type and size incentive contracts should be evaluated to be merge with the selective PDS used. This will provide a "fail-safe" for scheduled delivery and quality.

Types of incentive structures to be considered on project:

(1) Cost-Plus-Percentage-of-Cost-Contracts (Not recommended for planned complex projects with cost control issues)

Premise of Incentive:

- ❖ *Incentive structure is used under extreme circumstance of poorly defined scope at the start of project operations.*
- ❖ *Emergency repair work as the result of a natural disaster or un-predicted condition*
- ❖ *Implementation time frame so aggressive that the level of difficult for scope completion or eventual costs cannot be accurately estimated.*

Key Concern:

- ❖ *Method depends on good faith of contractor not to "overcharge" percentage of contract*
- ❖ *"Cost-plus-percentage fee doesn't provide direct incentive for contractor to minimize construction cost."*

(2) Cost-Plus-Fixed-Fee Contracts

Premise of Incentive Based on:

- ❖ *Fairly well defined projects of typically similar to projects performed in the past by subcontractor*
- ❖ *Sufficient Estimate*
- ❖ *Field Incentive based on the following conditions:*
 - (1) *Project size*
 - (2) *Estimated construction time*
 - (3) *Nature of complexity*
 - (4) *Perceived hazards*
 - (5) *Project Location*
 - (6) *Equipment and Manpower need for accelerated completion*

Key Concern:

- ❖ *Contractors fee/ incentive is fixed upon owner-contractor negotiation and eliminates future fluctuation*



(3) Incentive Contracts (Strongly encouraged on BOT & DBOM jobs)

Premise of Incentive:

- ❖ *Incentive contracts are two fold, contract incentive can apply to either cost or time adherence.*
- ❖ *Incentive structure - contractor and owner agree to target estimates of cost and time for construction and/or design-maintenance portion of the project.*
- ❖ *Bonus or penalties are directly tied to target estimates and are non-negotiable once agreed to.*
- ❖ *To stimulate costs savings, bonus clauses can be written into contract to provide shared savings, in addition to base fees stated as percentages of contract amount when **[actual costs < targeted estimate]***

Key Concern:

- ❖ *Incentive contracts adhere well to Cost-Plus-Fee/ GMAX arrangement*
- ❖ *Arrangement must applied to defined work with drawings and specifications sufficiently completed for project development*
- ❖ *Bonus-Penalty arranged should not be considered as liquidated damages since arrangement is accessed as a direct penalty or incentive*
- ❖ *~ 25% is used to calculate shared GC savings in arrangement*



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Construction Management

Table 3: A PDSS Risk/ Organizational Structure Decision Table

Risk Factors/Org. Structure	Traditional (TD)	Design/Build (D/B)	CM (General Contractor) (CMGC)	CM (Agency) (CMA)	Risk Factor Range Organization
<i>Project Characteristics (scope, complexity)</i>	Well defined scope; better suited for industry and standard jobs	Well defined projects; industry standard as well as slightly complex jobs	Fairly well defined, relative complex	Poorly defined, highly complex jobs	Well defined [TD] [D/B] [CMGC] Poorly defined [CMA]
<i>Time</i>	Not of the Essence	Better when time is of the essence	Time is generally critical	o.k. for both – slightly better when time is of the essence	Of the essence [D/B] [CMGC] [CMA] Not of the essence [TD]
<i>Owner Experience</i>	o.k. for both- better suited for inexperienced owners (relies on a/e)	Inexperienced owner, owner losses “checks and balances”	Critical that the owner be experienced	o.k. for both – better for an inexperienced owner	Experienced [CMGC] [CMA] Inexperienced [TD, D/B]
<i>Team Experience</i>	o.k. for both-better suited for inexperienced team	Better for experienced team	Critical that an experienced team be in-place	o.k. for both – slightly better for an inexperienced owner	Experienced [CMGC, D/B] [CMA] Inexperienced [TD]
<i>Quality</i>	Industry standard as well as “monuments”	Industry standard jobs with a little higher quality requirement	o.k. for both – better for industry standard jobs	o.k. for both - better for higher quality projects	Above Standard [CMA] [D/B] [CMGC] Industry Standard [TD]
<i>Cost</i>	Better when cost is important but not critical	o.k. for both – better when cost is critical	Better when cost is critical	Not critical	Critical [D/B] [CMGC] [TD] Not Critical [CMA]
<i>(Project) Composite Risk</i>	Low Risk	Low – Medium Risk	High Risk	High Risk	Low [TD] [D/B] [CMGC] High [CMA]



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Table 4: A PDSS Risk/ Contract Type Decision Table

Risk Factors/Contract Type	Lump Sum (LS)	Unit Price (UP)	Guaranteed Maximum Price (GMP)	Cost-Plus Fee (CFP) Reimbursement + Agreed Fee	Risk Factor Range	Contract
<i>Project Characteristics (scope, complexity)</i>	<i>Well defined scope; Complexity not an issue as long as scope remains defined</i>	<i>Well defined scope but final quantities not known; complex or non-complex jobs</i>	<i>scope fairly well defined, higher complex projects;</i>	<i>Poorly defined, complex jobs</i>	Well defined	[LS] [UP] [GMP] [CFP]
<i>Time</i>	<i>Not of the Essence</i>	<i>Not of the Essence</i>	<i>o.k. for both, better when time is of the essence</i>	<i>of the essence</i>	Of the essence	[CFP] [GMP] [LS] [UP]
<i>Owner Experience</i>	<i>Better for inexperienced owner</i>	<i>Better for inexperienced owner</i>	<i>o.k. for both; better for an experienced owner</i>	<i>Experienced Owner</i>	Experienced	[CFP] [GMP] [UP] [LS]
<i>Team Experience</i>	<i>o.k. for both-better for an inexperienced team</i>	<i>o.k. for both- slightly better for an experienced team</i>	<i>Experienced Project Team</i>	<i>Experienced Project Team</i>	Experienced	[CFP] [GMP] [UP] [LS]
<i>Quality</i>	<i>Industry standard and "monuments"</i>	<i>Industry standard jobs</i>	<i>o.k. for both; slightly better for industry standard jobs</i>	<i>Higher than industry standard</i>	Above Standard	[CFP] [GMP] [LS/D/B]
<i>Cost</i>	<i>Better when cost is important but not critical</i>	<i>Generally critical with some flexibility to account for unknown quantities</i>	<i>o.k. for both; slightly better when cost is not crucial</i>	<i>Not critical</i>	Critical	[LS] [UP] [GMP] [CFP]
<i>(Project) Composite Risk</i>	<i>Low Risk</i>	<i>Low – Medium Risk</i>	<i>Medium – High Risk</i>	<i>High Risk</i>	Low	[LS] [UP] [GMP] [CFP]
					High	



**Integrated Delivery Systems Research
Construction PDS Summary:**

According to the results given through table 3 (PDS Selection) & table 4 (Contract type), coupled with the specializations of the general contractor the most probable PDS used to delivery the Sears Centre job is as follows:

<i>Project Delivery Method Summary Probability</i>					
<i>Traditional Method (TD/DBB)</i>	<i>Design/Build (D/B)</i>	<i>CM General Contractor (CMGC)</i>	<i>CM Agency (CMA)</i>	<i>Total Results (%)</i>	<i>Probable PDS for Project</i>
0 %	57 %	29 %	14 %	100 %	D/B

Most Probable PDS used for Project should be: **Design-Build**

<i>Master Contract Delivery Probability</i>					
<i>Lump Sum (LS)</i>	<i>Unit Price (UP)</i>	<i>Guaranteed Maximum Price (GMP)</i>	<i>Cost Plus Fee (CPF)</i>	<i>Total Results (%)</i>	<i>Probable Master Contract</i>
0 %	14 %	86 %	0 %	100 %	GMP

Most Probable Master Contract Delivery used for Project should be: **GMP**

What happens if your organization is seeking to enter a market where they want to introduce a prototype while retaining it's assets for future development and profitability?



Why Integrated Delivery Systems for Sears Centre Project

Integrated delivery systems can be used as a tool to analyze present and future profitability in assets management. Equally important is its affect on procurement strategies. There are (3) basic integrated delivery systems that have emerged recently from successful project prototypes. These methods are as follows:

Integrated Delivery Systems:

(1) [P³] Public Private Partnership Initiative *(Viewed as integrative procurement for report)*

Models used under [P³] application

- ❖ DBO-Design Build Finance
- ❖ DB-Design Build
- ❖ BOO-Build Own Operate
- ❖ BOOT-Build Own Operate Transfer
- ❖ BBO-Buy Build Operate
- ❖ Finance Only
- ❖ Separate O & M
- ❖ Operation License

(2) [BOT] Build Operate Transfer System

- ❖ BTO-Build Transfer Operate
- ❖ BO-Build Operate
- ❖ BOOT-Build Own Operate Transfer

(3) [DBOM] Design Build Operate Maintain System

- ❖ DBO-Design Build Operate
- ❖ DBFO-Design Build Finance Operate

(Due to time constraints a pre-evaluation of the method will only be performed on the summary structured indicated above)

Note: BOT has been implemented as a strategy of Public Private Partnerships

A project of this complexity and type would be sufficient for a design build arrangement. However, do to two key conditions (1) municipality (Village of Hoffman Estates) to secure a venue with limited owner responsibility and (2) Ryan Companies/ CCO Entertainment to secure a re-occurring asset on the long term strategic plan for entry in the sports construction market, have given consideration for an integrated delivery system. The first step to an analysis of this type is two compute the maintenance and operations cost during the life time of the facility. As an arrangement, maintenance and operations costs can amount to nearly 3 x (construction costs) even if properly maintained. Cost of this type will only increase with concert and sports recreation type of



venues. The inherent condition is “ripe” for the institution of an integrated delivery system.

Successful systems have been implemented on:

- ✚ Healthcare projects (equipment procurement & maintenance strategies)
- ✚ Heavy Industrial Construction via Manufacturing, Chemical and Desalination Plants
- ✚ Infrastructure
 - (1) (FDOT)-Federal Department of Transportation
 - (2) Roadways (FHWA)
 - (3) Railroads (FRA)
 - (4) FAA-Airport Infrastructure (Northern Virginia’s Dulles Int’l toll road and metro-rail expansion)
- ✚ Recently Industrial Business Parks (*Southwestern United States*)

With the implementation of an integrated design and delivery come inherent constraints that depend on owner need, driven by culture and economic cycles. Contrary to belief, integrated delivery systems have been used in overseas markets since the 1800’s and beyond. A recent interview with an international construction company revealed the approach behind integrated delivery system is in fact procurement delivery paid and multi-facet currencies. Specifically developed for use in “third world” countries that have the need but lack the monetary or societal resources, integrated delivery has welcomed the opportunity for non-tradition payment for render services over a longer time frame. It should be advised that the success of this particular “industry depends on the political and socio-culture of a region.” Due to material shortages, the rise of plan-check services, third party accounting cost control (*Ernst & Young/ Merrill Lynch*), financial cost controls provided by accounting firms, owners now have financial obligations and options that were not part of development and construction 10 or 20 years ago.

One of the leading catalysts in the development of integrated delivery is the federal government. Like most owners both fed and state governments are endeavoring to achieve this best quality and process possible by:

- (1) Merging design-construction with long term cost reduction decisions and
- (2) Process Delivery with Assets management.

Although a private owner may not have the fiscal resources of a local government or municipality, similar results can be achieved by more conventional methods.

One such case is the use of Public Private Partnership for the development of NBA facilities. Two arenas have been developed using this method. The predecessor, the Rose Garden (*Portland, OR*) was developed on the premise of city recognition and homage to other noteworthy facilities (*Boston Garden-Boston, MA/ Madison Square Garden-New York, NY*). Spear headed by one single entity, the Rose Garden was a land mark venture for the public-private-partnership for commercial use. The frame work consisted of a



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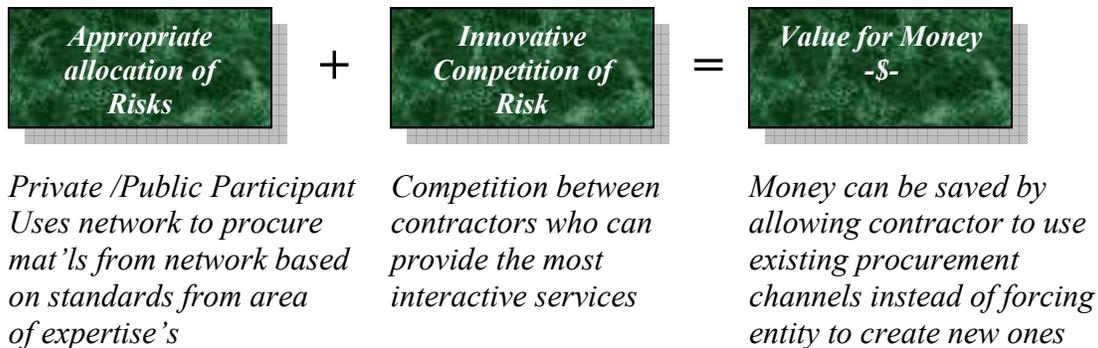
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[TIAA-CREF/ Prudential Insurance/ Farmer’s Insurance] loan consortium, Paul Allen-(Trail Blazers owner and principal representative), and the city of Portland tax payers’ base. Construction costs were partially funded by a \$ 155,000,000 commercial loan, of similar type and conditions used for the Hoffman Estates’ Sears Centre. Overall construction cost amounted to \$ 262,000,000 which was met via a joint arrangement (40 % / 60 %) split between tax payers and Paul Allen-Global Spectrum. Public private partnerships are effective when a city or local government desires to develop a specific area into an “Arena-Entertainment” zone to include hotel, restaurants, retail shops and other attractions. The other project to us a P³ arrangement was the, American Airlines Center (*Dallas, TX*), which also has created a management entity similar to COO entertainment to main its operation for new facility (American Airlines Arena) and aging asset (Reunion Arena). (AA Public/ Private Development Split (\$ 125,000,000/ \$ 105,000,000 ≈ 54 % / 46 % split)

Basic Concept behind [P³] Public Private Partnership(s):

Government led interdependence on private sector for adequate procurement of construction services:

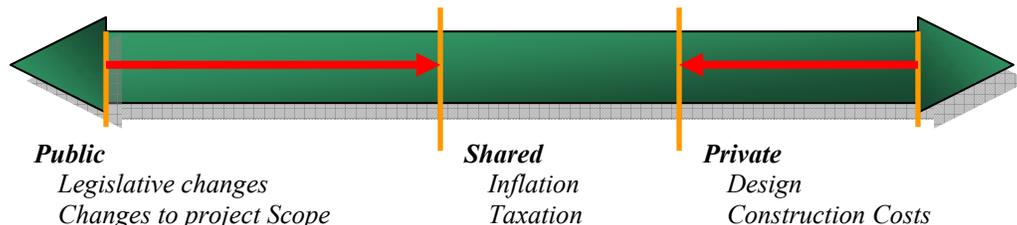
Addition of project value:



(Allowing qualified contractor to have specification re-adjusted if qualified engineering components in service procurement network).

Appropriate Allocation of Risks:

- Intent to minimize costs***
- Intent to provide greater financial certainty to public sector***





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*Land Acquisition
Governance
Sustainable political support*

*Permitting
Catastrophic Evt(s)*

*O & M Costs
Operation Performance
Technological obsolescence
Financing Commissioning*

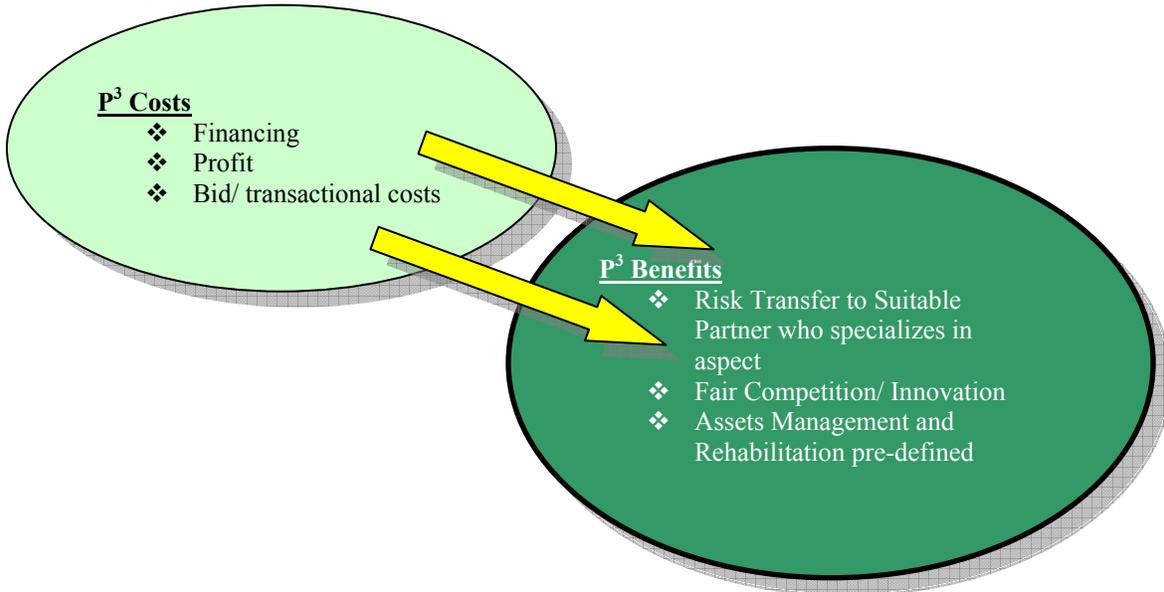
Innovative Competition of Risks:

- ✚ Approach to private sector has proven to be fair and open*
- ✚ Innovative solutions market life cycle costs as oppose to design and construction costs*
- ✚ Increase long-term value for public money*
- ✚ Reduction of tradition restrictions imposed by previous out-of-date specifications*
- ✚ Best product provided at Best price reflected in **B³** analysis.*
- ✚ Strict adherence to operating efficiency to avoid:*
 - (1) Duplication*
 - (2) Waste*
 - (3) Cost Overruns*
 - (4) Project Delays beyond conveyed procurement durations for products to reduce long term cost*

Value for Money:

Upfront Costs analysis, reduction is cost due to familiar procurement networks and project incentives

“Value for money is assessed by comparing P3 applicant against (PSC) public sector comparator (PSC) Construction Costs < (P3) Construction costs, (P3) Long Term Cost < (PSC) Operations Costs



Long term benefits outweigh implementation costs for large projects of high complexity.

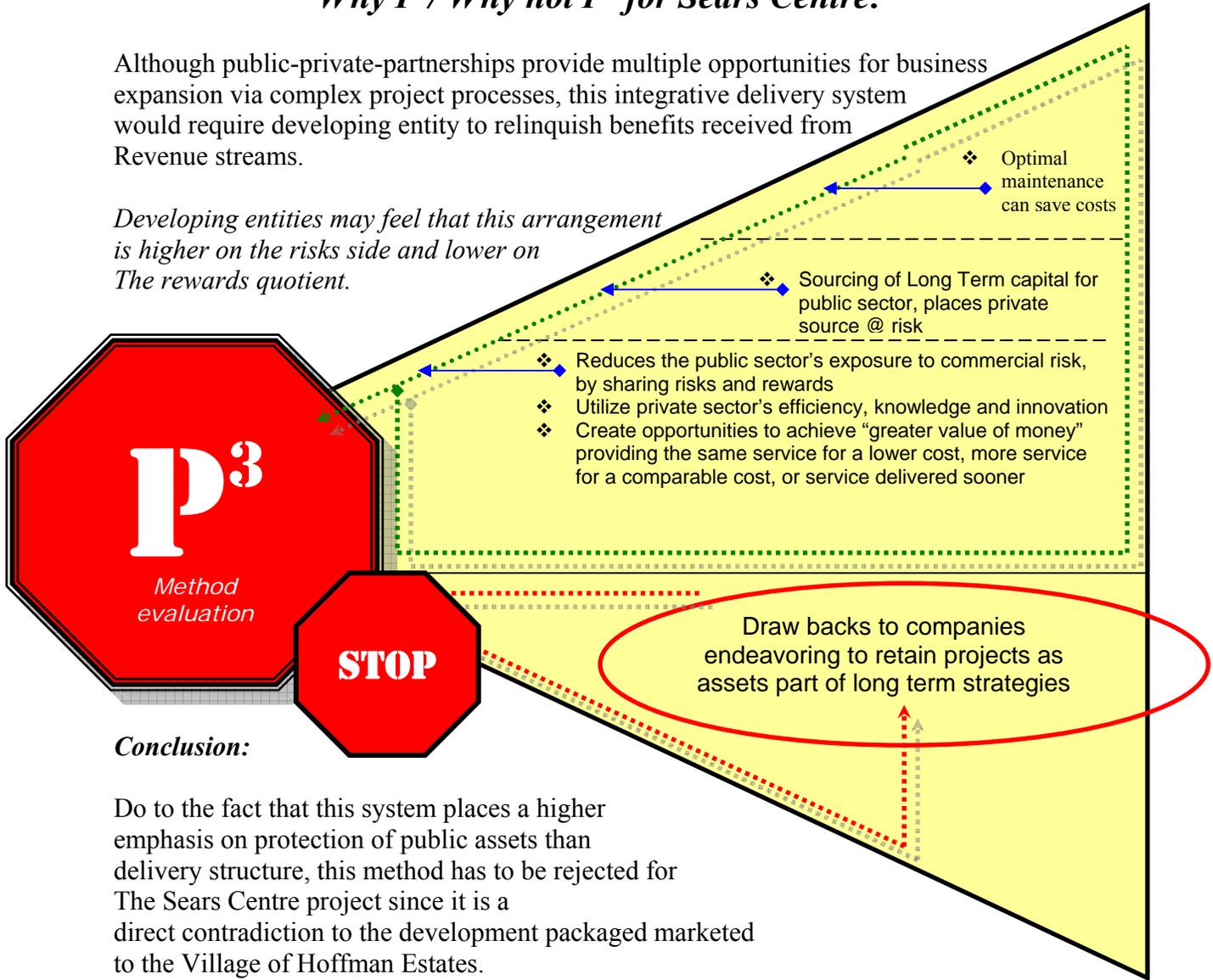


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Why P³/ Why not P³ for Sears Centre:

Although public-private-partnerships provide multiple opportunities for business expansion via complex project processes, this integrative delivery system would require developing entity to relinquish benefits received from Revenue streams.

Developing entities may feel that this arrangement is higher on the risks side and lower on The rewards quotient.



Conclusion:

Do to the fact that this system places a higher emphasis on protection of public assets than delivery structure, this method has to be rejected for The Sears Centre project since it is a direct contradiction to the development packaged marketed to the Village of Hoffman Estates.

Premise of Development Package:

- ❖ Facility to be provided @ a minimum financial and responsibility cost to village
- ❖ Adherence to financing terms that are nearly guaranteed w/ risks and benefits the contractual arrangement undertaking by the development team

As a result a different integrated delivery system will should be selected which:

- ❖ Maximizes and protects both private and public funds equal with growth incentive
- ❖ Provides indirect compensation for contractor initiated feasibility studies
- ❖ Permits higher potential for incentive if adherence to strict penalties are required



Finalizing the appropriate Integrated Delivery Systems for Sears Centre Project

Inherent project constraints have validated the remaining two integrated delivery methods as probably project delivery systems. The major premise behind these two remaining PDS(s) is the private owner/ private contractor(s) approach to integrated delivery management. As a preference to future arena development, it is important to determine early what conditions would warrant an integrated delivery system for the non-governmental commercial construction industry. Issues that may warrant system use are concise and cover a broad range of topics

Conditions which should consider warranting integrated delivery in private industry:

- + Aggressive schedule on complex project driven largely by “Liquidated Damage Clauses”
- + When building and operations costs have a substantial impact on decision to pursue project
- + Overly sensitive time delivery for projects above the \$ 40,000,000 cost threshold
- + Projects which have significant implication of forecasting the financial future of a region via direct or indirect surrounding development
- + Market Forces
- + Corporate Strategic Plan forecast
- + Growth Opportunities

Strategies used for defining the selection:

- + Decide early whether project needs to merge Full Delivery Method with Program Management (*Can be crucial when selected either DBFO or DBOM method*)
- + Determine three primary precedence in successive order of importance:

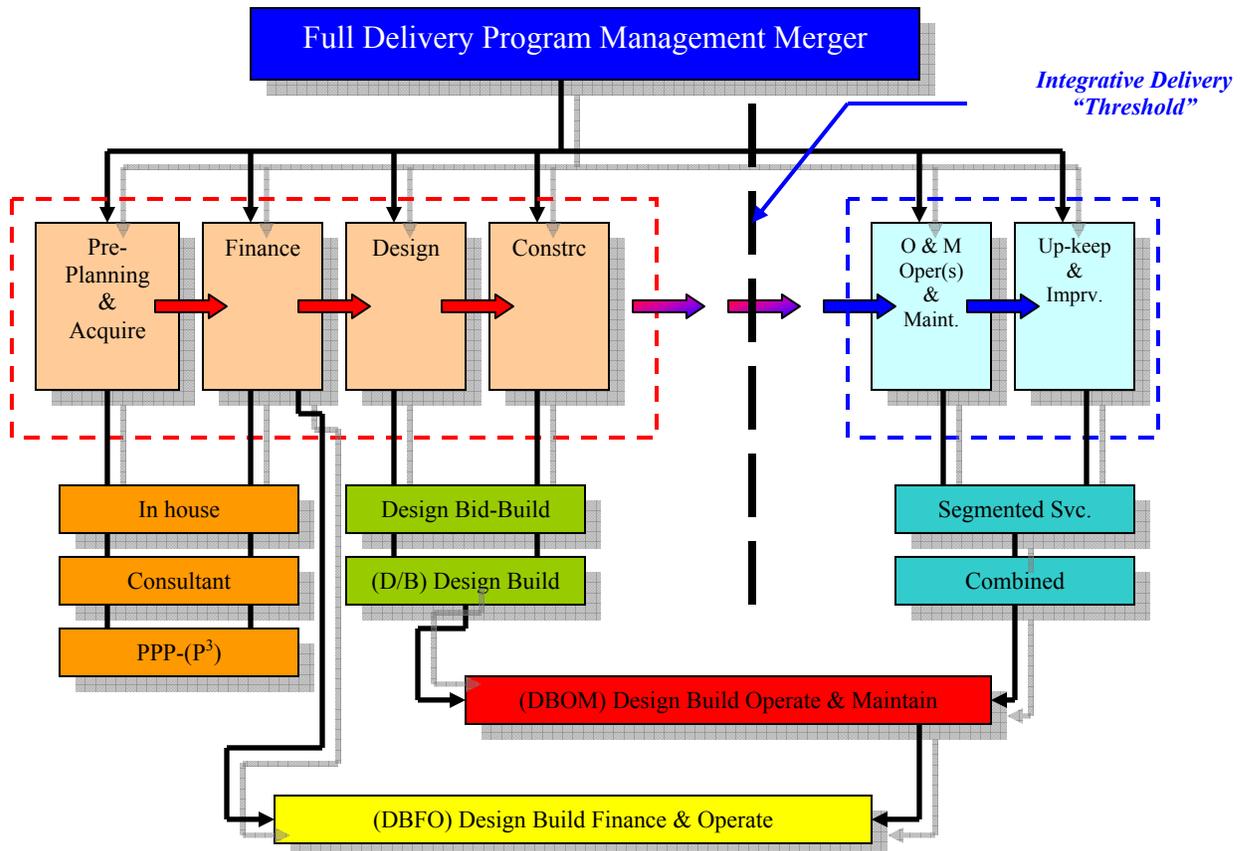
<i>Primary Precedent</i>	<i>Ascertained Level of Importance</i>
<i>Time-(Fixed Date Delivery)</i> <u><i>Proposed Strategy:</i></u>	<input type="checkbox"/> (5)-Paramount Importance Flexibility Non-negotiable
	<input type="checkbox"/> (4)-Strictly adhere to crucial lateral impacts on PDS
	<input type="checkbox"/> (3)-Important please evaluated for owners approval
	<input type="checkbox"/> (2)-Equal Precedence
	<input type="checkbox"/> (1)-Probable for flex adjustment
<i>Quality</i> <i>(Best-Value Products</i> <i>(Best Value Process)</i> <u><i>Proposed Strategy:</i></u>	<input type="checkbox"/> (5)-Paramount Importance Flexibility Non-negotiable
	<input type="checkbox"/> (4)-Strictly adhere to crucial lateral impacts on PDS
	<input type="checkbox"/> (3)-Important please evaluated for owners approval
	<input type="checkbox"/> (2)-Equal Precedence
	<input type="checkbox"/> (1)-Probable for flex adjustment
<i>Costs-(Fixed Budget)</i> <u><i>Proposed Strategy:</i></u>	<input type="checkbox"/> (5)-Paramount Importance Flexibility Non-negotiable
	<input type="checkbox"/> (4)-Strictly adhere to crucial lateral impacts on PDS
	<input type="checkbox"/> (3)-Important please evaluated for owners approval
	<input type="checkbox"/> (2)-Equal Precedence
	<input type="checkbox"/> (1)-Probable for flex adjustment



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- ✚ Determine estimated maintenance and operations costs of project
- ✚ Evaluate the condition of in-house facilities management if applicable, other wise compute the costs benefit of joint venturing or purchasing O&M firm who specializes in potential project
- ✚ Embed “VE” with cost reduction initiatives
- ✚ Evaluated contractor/ construction entity procurement network
- ✚ As a side note reference “Lean and 6σ” Strategies in process improvement
- ✚ Evaluate Contractor/ Subcontractor incentives for time/ or costs reduction measures
- ✚ Determine optimum owner-client/design entity payment structure
- ✚ Compute project life-cycle
- ✚ Determine maintenance duration
- ✚ Analyze possible revenue streams on project
- ✚ Calculated initial investment loss if it to be reimbursed by owner at owners expense





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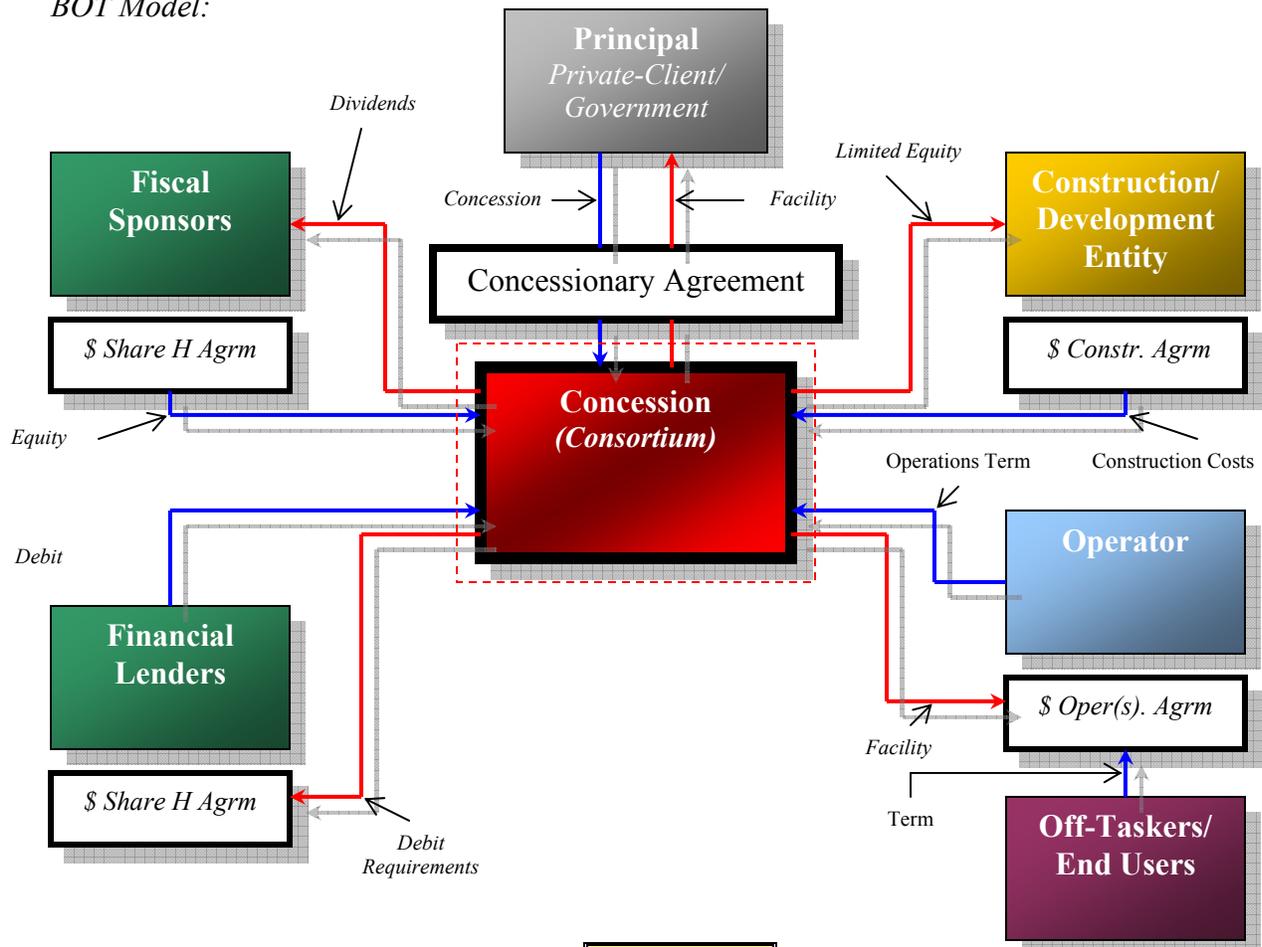
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Selecting the preferred method:**

Premise of [BOT]-Build Operate Transfer Model: “Private Finance”

The ‘BOT’ approach enlist the duties of a private party (concessionary) retained as a concession for a fixed period from a public party or client (principal). The concessionaire⁽¹⁾ will assume the responsibilities for the development and operations of the proposed facility. Development consists of (1) Financing, (2) Design and Construction of facility, (3) Adequately managing and maintaining facility per agreed upon standards and (4) creating a profitable property during and beyond concession period. Return on investments is secured by the concessionaire while operating property pre principal turnover. At the end of the ‘concession period’ the facility is successful handed to the principal free of liens and at now costs to client. During the arrangement construction costs incurred for project are reimbursed prior to turnover date.

(1) Concessionary – an entity whom enters a contractual agreement to profit from performance of rendered services to a client for a specified duration. During this duration the concessionary asks as the “pseudo-owner” and operates all functions of the property

BOT Model:





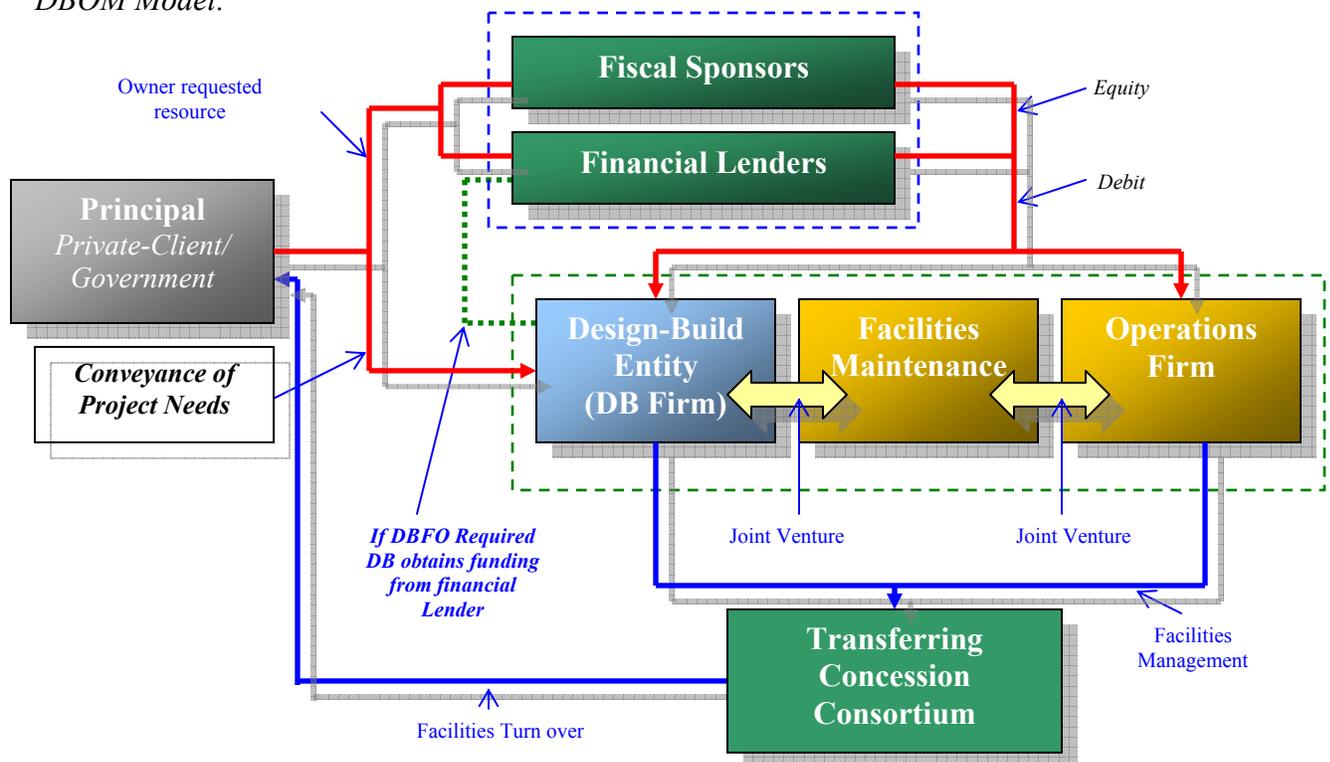
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Premise of [DBOM]-Design Build Operate Maintain Model: Long Term Asset(s) management

Construction entity performs the role of facility operator in addition to the (1) pre-construction services, (2) design and (3) actual construction of project. The construction entity will enter a “joint-venture” and/ or absorb a design build firm and operations management company. Similar to a design-build contract, one master contract is distributed to client to cover the costs of facilities development = construction + operations. When financing becomes part of the scope requested by the client services are melded to create a hybrid (DBFO)- “Design Build Finance and Operate” approach. Typically the prescribed O & M contract duration is between 10 to 15 years, however for complex projects of large scale use longer durations should be evaluated (20 to 30 year time frame). The introduction of an O & M team allows designers and contractors to reference necessary procedures and O & M knowledge bases for accurate life cycle costs. Upon contract award, client negotiates a construction costs needs and O & M contract requests for a specified period. If actual costs for facilities and maintenance operations exceed the “CM” fee, costs will be absorbed by the construction entity. As a result, this method is most suitable for a GMP/ GMAX/ Reimbursable structure. Equally important to this delivery method are the incentive/ dis-incentive (penalties) used for project completion.

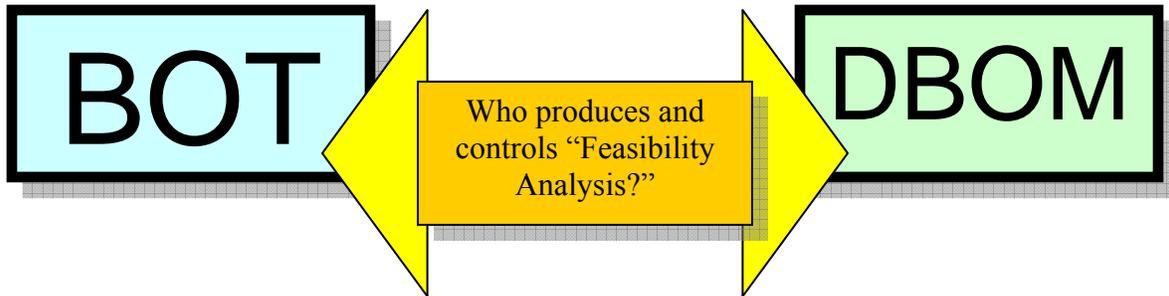
DBOM Model:





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Primary Difference between BOT & DBOM:



Feasibility Study

Initiated by Construction Entity (*Contractor control*)

Feasibility Study

Initiated by Owner (*Owner control*)

Finalizing which integrated delivery method to pursue largely depends on the delivery method selected in the above PDS. Under normal conditions, the owner is defined as a client who doesn't influence the workings of business strategies internally. Since a joint internal relationship exist between Ryan Companies and CCO Entertainment, in order to reconcile this difference, both entities will assume a client base relationship where CCO (Owner) contracts services from Ryan Companies (Construction Entity).

Decisions base on assumed decision from selection criteria chart:

Preferred PDS Selected	BOT Track	DBOM Track	Preferred PDS Selected
CMA / CM@ Risk			DB
Master Contract Arrangement (Assumed)			Master Contract Arrangement (Assumed)
<input type="checkbox"/> Unit Price (Not Valid)			<input type="checkbox"/> Unit Price (Not Valid)
<input checked="" type="checkbox"/> Lump Sum			<input type="checkbox"/> Lump Sum
<input type="checkbox"/> Cost Plus			<input type="checkbox"/> Cost Plus
<input type="checkbox"/> GMAX			<input checked="" type="checkbox"/> GMAX
<input type="checkbox"/> Added Incentives?			<input checked="" type="checkbox"/> Added Incentives?
Maintenance Options			Maintenance Options
Maintenance Option via:			Maintenance Option via:
<input type="checkbox"/> In house			<input checked="" type="checkbox"/> In house
<input checked="" type="checkbox"/> Joint-Venture			<input checked="" type="checkbox"/> Joint-Venture
<input type="checkbox"/> Firm Buyout			<input checked="" type="checkbox"/> Firm Buyout
Commissioning Experience:			Commissioning Experience:
<input checked="" type="checkbox"/> Experienced			<input checked="" type="checkbox"/> Experienced
<input type="checkbox"/> Intermediate			<input type="checkbox"/> Intermediate
<input type="checkbox"/> Will need to acquire			<input type="checkbox"/> Will need to acquire
Level pre-construction services offered			Level pre-construction services offered
<input type="checkbox"/> Design/ Constr. Review			<input checked="" type="checkbox"/> Design/ Constr. Review
<input checked="" type="checkbox"/> VE Analysis			<input type="checkbox"/> VE Analysis



<input type="checkbox"/> Procurement Solutions <input checked="" type="checkbox"/> Financing Alternates <input type="checkbox"/> Substantial Bond Cap. <input type="checkbox"/> Develop Solutions		<input checked="" type="checkbox"/> Procurement Solutions <input checked="" type="checkbox"/> Financing Alternates <input type="checkbox"/> Substantial Bond Cap. <input checked="" type="checkbox"/> Develop Solutions
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Staying consistent with the PDS network at this point the recommended Integrated Delivery System to be used on the Sears Centre Project is DBOM. Implementing integrated delivery systems are a healthy way to develop a procurement network to maximize profits when incentives are specified.

Substantiating the decision to use DBOM for (Sears Centre):

- + DBOM acts a quality baseline for design and construction of private projects similar to quality assurance guidelines of a P3 model less the inappropriate protection of private funds.
- + DBOM diminishes the challenges of start-up problems, claims and system integration
- + Reduces opportunity for cost growth while simultaneously increasing likelihood of achieved financial targets (\$ 50,000,000 contract limit imposed by master contract negotiation)
- + Accelerates completion schedule by providing scheduling certainty upfront
- + Providing Sustainability:
 - ❖ Using inherent contract incentive structure (typically established as high as 25% of subcontract amount for meeting condition)
 - ❖ Reduction in risks related to system integration by requiring (DBS) Design-Build –Supplier to work together on solutions
 - ❖ Cost savings can be used to fund cost of higher performing products for building systems (\$Costs implements appear nearly invisible to owner)
 - ❖ Reduction in energy usage/ fractional implementation life cycle analysis for project regardless of “Green Status”
- + Financial Benefits:
 - ❖ Baseline cost of O & M of building can be distributed as set amount to reduce an flocculation
 - ❖ Reduction in the owners capital costs/ long term budget savings
- + Commissioning Responsibilities:
 - ❖ Third party commissioning to reduce bias assessment in the evaluation and calibration of building system components
 - ❖ Commission moved to contractor controlled service as part of project delivery package
- + Project Processing:
 - ❖ & M firm to be integrated in design and construction panel for project during pre-construction phase
 - ❖ Establishment of effective communication and electronic database log
- + Elimination of “Profit Protection”:



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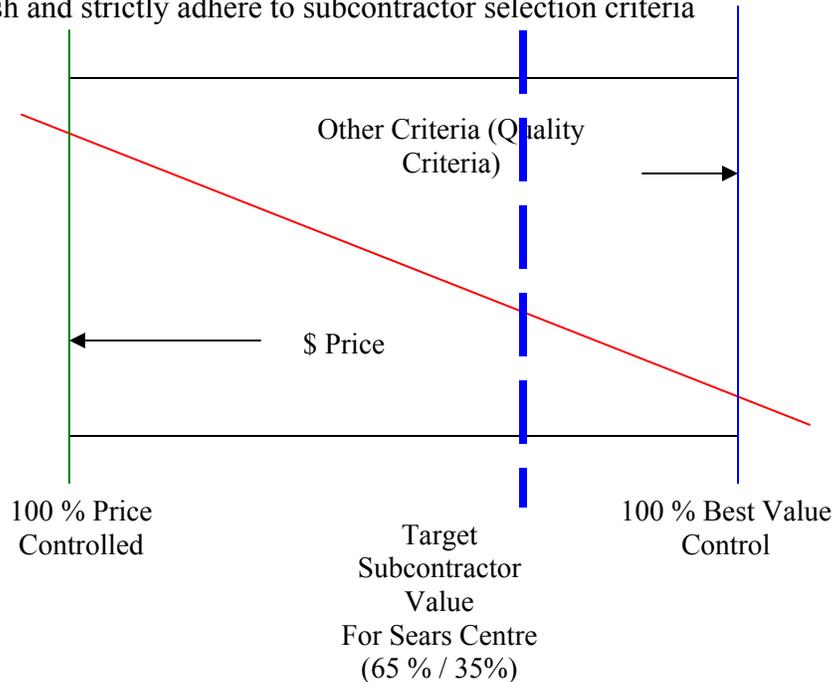
- ❖ DBOM established incentive make obtaining a profit impossible without assurance of product and process quality

Extended Maintenance Contract (Project Plus):

- ❖ Extended Maintenance Contract (10-15 Yr(s) < 20-30 Yr(s)) reduction in long term system costs

Key Concern:

- ❖ DBOM will have a lengthy RFP process. All proposal should be viewed based on best value intent, not price
- ❖ Establish and strictly adhere to subcontractor selection criteria



- ❖ Require all participants to submit RFI (*Request for Intent*) prior to life cycle costs analysis.
- ❖ Be careful not to set incentive or penalty schedule too high, may have an adverse affect on project subcontractors performance or willingness to bid project

Inherent benefits and drawbacks to DBOM delivery for Sears Centre by comparison:

Delivery Method	Advantages	Disadvantages
D-B-B	<ul style="list-style-type: none"> • Long History of Acceptance • Open Competition • Distinct Roles are Clear • Owner Flexibility • Easy to Tender 	<ul style="list-style-type: none"> • Innovation Not Optimized • Usually results in cost overruns • Disputes between parties • Client Retains Most Risks



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<p>DBOM</p>	<ul style="list-style-type: none"> Partnership • Owner Flexibility • Integrates the Process of Design, Construction, and Maintenance • One Contract for All Services and Products • Maintenance & Any Operations Aspects can be considered during design • Projects Completed Faster • Better Life Cycle Costs • Similar Benefits Earlier Mentioned in D-B 	<ul style="list-style-type: none"> • Longer Tendering Process • Costly Tendering • Similar disadvantages as earlier mentioned in D-B
<p>DBFO</p>	<ul style="list-style-type: none"> • Complete projects that could not normally be accomplished with internal funding • Integrates the process of design, construction and maintenance • Maintenance & Any Operations Aspects can be considered during design • Projects completed faster • Better Life Cycle Costs • Better Net Present Value (NPV) • Similar Benefits Earlier mentioned in D-B • Private Financing with no revenue Risk 	<ul style="list-style-type: none"> • Costs more in the Long Run • Longer Tendering Process • Costly Tendering • Similar Disadvantages as earlier mentioned in D-B • Difficulty with Long Term Relationships • Future Political Changes May not accept/ agree with prior agreements/ commitments
<p>FD or PM</p>	<ul style="list-style-type: none"> • Shorter Time to Project Completion • Fully Integrated Process From Project Inception • Maximizes Planning & Reduces Problems during execution • Knowledgeable Alternative Funding Sources • Good for Large & Complex Projects • Single Source of Expertise • Quality should be greater 	<ul style="list-style-type: none"> • Difficult to tender and not knowing costs • Compatibility issues with client • Quality Based Selection Process (Negotiated) • Client Needs to make decisions quicker
<p>BOT & BOOT</p>	<ul style="list-style-type: none"> • Same Benefits as DBFO • Usually for Toll Roads • Includes the Operations Aspects • Ownership is Transferred 	<ul style="list-style-type: none"> • Same Disadvantages as DBFO • Difficulty with Long Term Relationships • Future Political Changes may not accept or agree



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		with prior arrangements/ commitments
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Feasibility of Proposed Integrated Delivery System

Criteria used in evaluating the validity of proposed PDS for Sears Centre:

- ❖ *On Time Delivery*
- ❖ *Delivery Under budget*
- ❖ *Break Even Analysis time frame duration*
- ❖ *Excellence in Design*
- ❖ *Remaining True to corporate identity through accountability measures*
- ❖ *MBE/ WBE participation*
- ❖ *Adherence to appropriate trade wages*

Analysis of Capital Costs merger and profitability of project:

- ❖ *Computing Maintenance Costs*
- ❖ *Computing Operations Costs:*
- ❖ *Computing Yearly Profit and Overall Profit of Deficient for yearly operation*
- ❖ *Arena Depreciation*
- ❖ *Depreciation Basis of an asset using straight line depreciation*

Preliminary Fiscal Analysis

Depreciation Basis of an asset = $C - S_n$

Initial Assets Cost [C]

Assumed salvage value of asset = $[S_n] = \$25,000,000$

(Assuming Arena asset will be worth half its value 50 years from completion)

Straight Line Depreciation = $D_i = (C - S_n) / N$

N = 50 Yr(s)

$D_{(Sears\ Centre)} = [\$ 50,000,000 - \$ 25,000,000] / 50 = \$ 500,000$ annual depreciation

Yearly Operations Costs (Based on time, location factors to San Diego Convention Center & San Diego, CA → Chicago, IL CPI indices)

Assumed Sears Centre yearly Operations Costs = \$ 4,479,000

Yearly Maintenance Costs (Based on location and size factor to Bryce Jordan Center)

Assumed Sears Centre yearly Operations Costs = \$ 448,000_(less ME VE) = \$ 422,200



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*Arnon L. Bazemore
Construction Management*

GOAL	DBOM	DB w/ Outsourced O & M	DB w/ In-House O & M
On Time Delivery			
<ul style="list-style-type: none"> • Early certainty reschedule • Delivery within schedule 	<p>Yes</p> <p>High probability</p>	<p>Yes</p> <p>High probability Note: additional interfaces increase risk of delayed opening</p>	<p>Yes</p> <p>High probability Note: additional interfaces increase risk of delayed opening</p>
Delivery Under Budget			
<ul style="list-style-type: none"> • Early certainty of re-construction costs • Avoidance of construction of cost growth 	<p>Yes</p> <p>Highly Probable</p>	<p>Yes, Note: Price likely to be higher than for DBOM approach due to Contractor uncertainty of operations via 3rd party O & M procedures for Arena</p> <p>Probable</p>	<p>Yes, Note: Price likely to be higher than for DBOM approach due to Contractor uncertainty of operations via 3rd party O & M procedures for Arena</p> <p>Probable</p>
Break Even-On Operations by Specified Date			
<ul style="list-style-type: none"> • Early certainty re O & M costs, thus facilitating planning to achieve goal 	<p>Base O&M cost provided on a percentage base, long term goal to be fixed for a 30 yr duration evaluated every 10 yr(s) of operations</p>	<p>O & M costs must be estimated for planning purposes; actual amount will be determined only when the contract is awarded; contract will probably be long-term, increasing value of information for planning purposes</p>	<p>O & M costs must be estimated for planning purposes; Long Term information requested</p>
Excellence Design			
<ul style="list-style-type: none"> • High quality design/construction • Addressing life cycle cost • Efficiently managing systems 	<p>Probable—DBOM provides incentives for contractor to address O & M issues during design and construction</p> <p>Due to the complexity of the system and likelihood of glitches during the initial operations period, the system</p>	<p>Since there is no built-in incentive to improve design to reduce life cycle costs, the owner should consider alternative means of achieving that goal.</p> <p>This approach would require owner to manage interface between design/</p>	<p>Since there is no built-in incentive to improve design to reduce life cycle costs, the owner should consider alternative means of achieving that goal.</p> <p>This approach would require owner to manage interface between design/</p>



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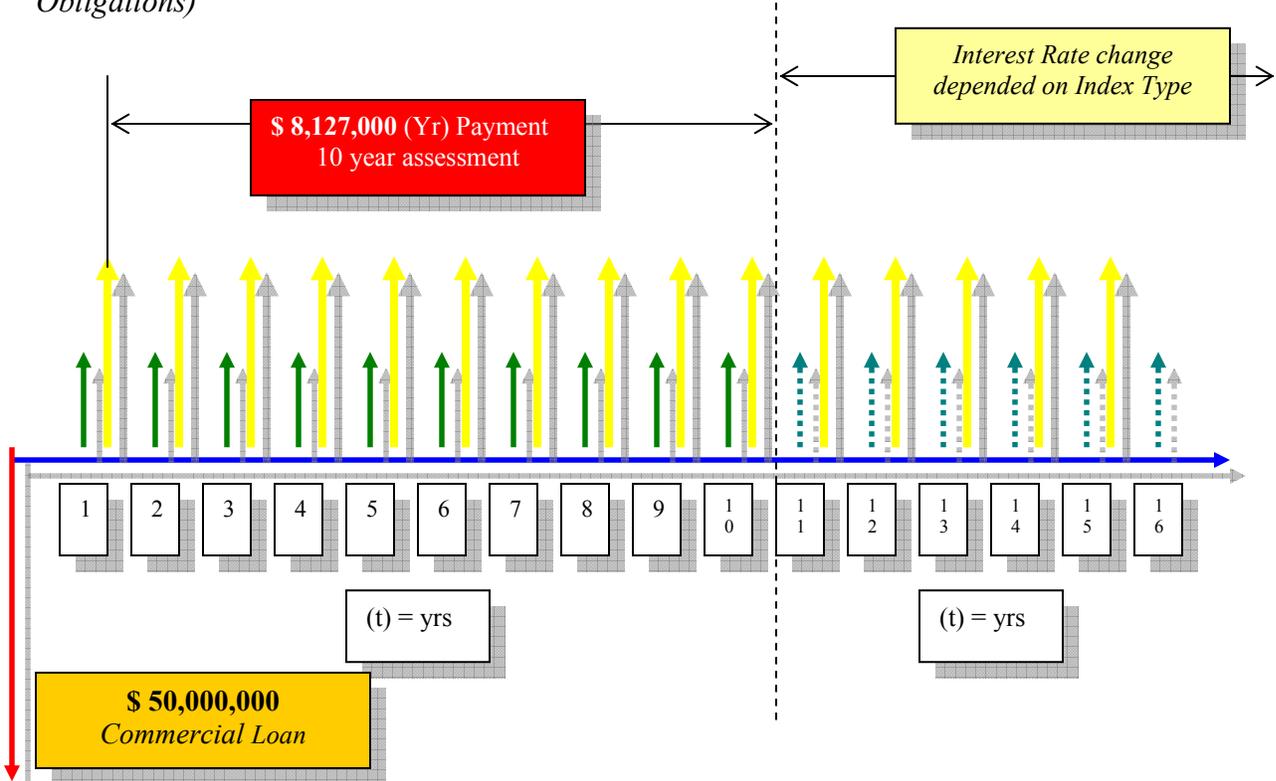
<p>integration into operations phase</p> <ul style="list-style-type: none"> • Environmental Sustainability 	<p>designer and supplier is the best qualified to correct start-up challenges, achieve reliability most quickly and avoid claims and disputes between multiple contractors or contractor and owner</p> <p>Yes (Contract performance standards compliance mechanisms required.)</p>	<p>construction and O & M personal, creating opportunity for contractor claims and allowing arguments that O & M caused problem. Also owner would need to hire O & M staff/ consultants to provide input into design and construction</p> <p>Note: Third party probably will not be able to perform as well as the system supplier during the initial operations phase. If problems arise during O & M period, contractor may claim they are due to faulty maintenance or operator error</p> <p>Yes (Contract performance standards compliance mechanisms required.)</p>	<p>construction and O & M personal, creating opportunity for contractor claims and allowing arguments that O & M caused problem. Also owner would need to hire O & M staff/ consultants to provide input into design and construction</p> <p>Note: Owner probably will not be able to perform as well as the system supplier during the initial operations phase. If problems arise during O & M period, contractor may claim they are due to faulty maintenance or operator error</p> <p>Yes (Contract performance standards compliance mechanisms required during DB phase; direct owner control during O & M phase)</p>
<p>Remain True to corporate identity as a EOE DB</p>			
<ul style="list-style-type: none"> • Social sustainability (family wages/ benefits) • Diversity (during Construction and O & M) • MBE & WBE Solicitation • Adherence to Trade Wages (Equal Comp. Process) 	<p>Yes (O & M contract performance standards and compliance mechanism required.)</p> <p>Yes (O & M contract performance standards and compliance mechanism required.)</p> <p>Note: DBOM offers long-term opportunity to strategize and collaborate with contractor. RFP/ RFI requirement to include “up-front” proposal for MBE/ WBE solicitation during Construction and O & M stage during project life span</p>	<p>Yes (O & M contract performance standards and compliance mechanism required.)</p> <p>Yes (O & M contract performance standards and compliance mechanism required.)</p>	<p>Yes (Direct control by owner)</p> <p>Yes (Direct control by owner)</p>



SEARS CENTRE

Financial Verification of proposed Method
(Cash Flow Cost/ Benefits Assessment)

Assumed Cash Flow Curve Strictly for Σ (DB Services, Maintenance and Operations Obligations)



Total Fixed Annuity Costs per Year of Operations, Maintenance and Loan Repayment

	10 yr Annuity Loan Payment	\$ 3,200,000
(Capital Cost incl.)	→ Annual Maintenance	\$ 448,000 (\$ 422,200)
	<u>Operations (Yearly)</u>	+ \$ 4,479,000
	Total Annuity Payment	\$ 8,127,000 (\$ 8,101,200)

Project Costs during a 10-yr operations cycle will amount to \$ 81,270,000, which is roughly (2) times the amount of the construction cost. This further validates the use of an integrated delivery system for the Sears Centre project. With a contingency plan for purchasing a critical HVAC Unit, Electrical Component and absorbing a maintenance operation a 10-yr arena costs could easily approach \$ 90,000,000. Equally important to the decision to pursue this type of delivery is computation of the project profitability. Profitability come from several sources, the Sears Centre plan, as with most sports facilities is to generate revenue from (1) Suite Sales, (2) Ticketing and (3) Event booking. Galliard, LLC (A leading sports facility and entertainment consultant) has calculated that the current project will yield annual revenues, directly attributed to Sears Centre operations at an estimated \$35,000,000 an additional \$ 37,000,000 million attributed to indirect sales, via enticed developments of the region.

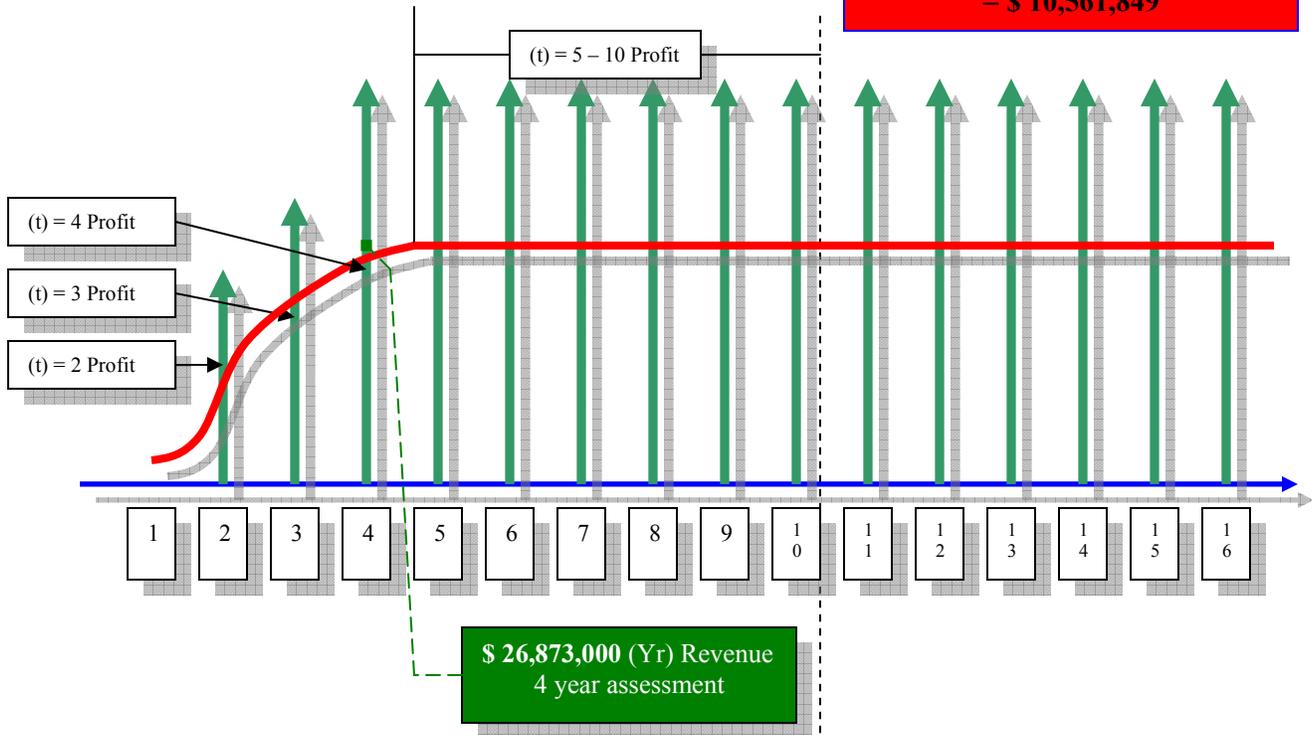


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Construction Management



Assume total yearly costs with taxes:
\$ 8,127,000 x $\sum (1, 20\%, 9.964\%)$
= \$ 10,561,849

Perceived Cash Flow for 10 yr revenue source:



Perceived Yearly Revenues	\$ 35,000,000
<u>Total Yearly Costs</u> (less)	<u>\$ 11,000,000</u> (Misc. Svc. & Tax)
Yearly Income	\$ 24,000,000

Costs/ Benefit Analysis:

Year	Costs	Yearly Income
1	(\$ 3,100,000)	\$ 3,900,000
2	(\$ 11,000,000)	\$ 5,300,000
3	(\$ 11,000,000)	\$ 7,655,000
4	(\$ 11,000,000)	\$ 15,873,000
5	(\$ 11,000,000)	\$ 24,000,000
6	(\$ 11,000,000)	\$ 24,000,000
7	(\$ 11,000,000)	\$ 24,000,000
8	(\$ 11,000,000)	\$ 24,000,000
9	(\$ 11,000,000)	\$ 24,000,000
10	(\$ 11,000,000)	\$ 24,000,000
(\sum Sum Total) =	(\$ 102,100,000)	\$ 176,728,000



Benefit Analysis

Using the DBOM approach, a DBOM consortium (CCO-Entertainment-Ryan Companies) would be responsible for incurring (\$ 3,100,000 @ yr (1) and \$ 11,000,000 @ 9 yrs) a cumulative debt of \$ 102,000,000 for a 10 yr span. The same PDS will intern generate \$ 24,000,000 of income, starting at year (5), to return a 10 year profit of \$ 176,628,000, nearly 4 (353 %) times the amount of the entire construction cost. The arrangement if worked properly will pay for itself within 5 yrs of the Sears Centre Operations.

Five Year Analysis:

$$\$ 3,900,000_{(t=1)} + \$ 5,300,000_{(t=2)} + \$ 7,655,000_{(t=3)} + \$ 15,873,000_{(t=4)} + \$ 24,000,000_{(t=5)} = [\$ 56,728,000_{(Five\ Year\ Profit)} + \$ 5,000,000_{(10\% \text{ Fee})}]$$

Total Five Year Profit = \$ 61,728,000

$$Measurable\ Benefit = \$ 61,728,000 - \$ 50,000,00 = \$ 11,728,000$$

Integrated Delivery System Conclusion

Final recommendation for the Sears Centre Delivery is to employ the use of a hybrid integrated delivery systems that merges third part financing using a concessionary arrangement similar to a Design-Build-Operate-Finance approach. Since the master construction contract was executed as a Design-Build GMAX/ this arrangement should carry over for administration of all O & M services. Project procurement should follow the requirements out line in a DBOM approach which were adopted from a P³ arrangement.

PDS Recap

- + Financing
- + Procurement & Contracting
- + O & M Services

Delivery System Structure

- Use DBFO Approach
- Use BOT Strategy
- Use (GMAX) incentive

By revisiting the initial selecting criteria, it was determined that since Ryan Companies will assume the General Contracting/ CM Agency role for producing a product for internal transfer, the most probable delivery model most suited for this project is.....

Build Operate Transfer

- + If MVE (Mechanical Value Engineering) measures are implemented Sears Centre could save \$ 25,800 annual, over a 10-yr period amount saved is \$ 258,000. (10 yr total payback → \$ 176,986,000)