Construction Delivery Methods Decision Matrix

Project Level Issues

1) Project Size

Project size reflects the dollar value and physical dimensions of the transit corridor.

DESIGN-BID BUILD	
Advantages	Disadvantages
□ DBB has been shown to work on projects of all sizes.	□ As projects grow in size, the amount of owner staffing required to oversee DBB can become very large.

CONSTRUCTION MANAGEMENT AT RISK	
Advantages	Disadvantages
□ CMR has been shown to work on projects of all sizes.	□ If not managed well, the use of multiple bid packages to facilitate CMR can be difficult

DESIGN-BUILD	
Advantages	Disadvantages
□ DB has been shown to work on projects of all sizes. □ Some owners have noted that DB can facilitate better management of large projects due to the single source of responsibility.	□ As projects grow in size, there can be large peaks in owner staffing requirements with DB (e.g., during RFP development, during design review, etc.).

Table 1

	DBB	CMR	DB
1. Project Size			

Key: ● Most appropriate delivery method
o Appropriate delivery method
○ Least appropriate delivery method
X Not applicable (discontinue evaluation of this method)

Comments: _____
_____
_____
_____

2) Cost

This issue represents several aspects of project cost like ability to handle budget restrictions, early and precise cost estimation and consistent control of projects.

DESIGN-BID-BUILD	
Advantages	Disadvantages
□ Costs are known at bid time, before construction begins. □ Project can benefit from low-bid procurement. □ Project can benefit from unit price bidding because quantities are defined prior to procurement.	□ Construction costs are not fixed (or locked in) until design is 100% complete. □ Constructability advice and contractor innovations are not available to save cost until post bid. □The DBB process is prone to change orders and cost growth after award.

CONSTRUCTION MANAGEMENT AT RISK	
Advantages	Disadvantages
□ CMR can be used in conjunction with a GMP pricing structure, which can be useful in negotiating and controlling costs □ If open book pricing can be used, all costs will be known by the owner. □ Costs will be known earlier when compared to DBB. □ Early constructor involvement or construction advice can lead to cost savings through value engineering and constructability reviews.	□ If multiple bid packages are used, the overall project cost could grow if later bid packages cost more than estimated. □ If a GMP pricing structure is used, owners may have some difficulty in negotiation.

DESIGN-BUILD	
Advantages	Disadvantages
□ If a lump sum pricing structure is used, costs will be fixed early in the project development process. □ DB has been shown to have lower average cost growth than DBB or CMR.	□ If a lump sum pricing structure is used, constructors must develop prices before plans are 100% complete and therefore must assume some risk in pricing.

Table 2 – Cost Advantages/Disadvantages Summary

	DBB	CMR	DB
2. Cost			

Key: ● Most appropriate delivery method
o Appropriate delivery method
○ Least appropriate delivery method
X Not applicable (discontinue evaluation of this method)

Comments: _____
_____
_____
_____

3) Schedule

This factor shows two aspects of project schedule and includes both the ability to shorten the schedule and the opportunity to control and prevent time growth.

DESIGN-BID-BUILD	
Advantages	Disadvantages
□ None	□ Likely to yield longest delivery schedule. □ Likely to yield the highest schedule growth. □ There is a lack of opportunity to compress schedule due to the linear nature of DBB.

CONSTRUCTION MANAGEMENT AT RISK	
Advantages	Disadvantages
□ Facilitates fast-tracking or the ability to bid multiple design packages. □ Studies have shown that CMR is faster on average than DBB, but slower than DB.	□ Risk that overlapping design and construction packages may create delays if not properly coordinated. □ Fast-tracking schedule will require owner effort in design and construction reviews.

DESIGN-BUILD	
Advantages	Disadvantages
□ Provides a single point of responsibility (DB contractor) for schedule control. □ Provides early schedule certainty. □ Historically, provides the least schedule growth. □ Provides opportunities for flexibility in schedule compression. □ Studies have shown that DB is faster on average than DBB or CMR.	□ Owner will sacrifice the checks and balances of having 100%-complete design prior to start of construction. □ Rapid schedule will require owner effort in design and construction reviews.

Table 3 – Schedule Advantages/Disadvantages Summary

	DBB	CMR	DB
3. Schedule			

Key: ● Most appropriate delivery method
o Appropriate delivery method
○ Least appropriate delivery method
X Not applicable (discontinue evaluation of this method)

Comments: _____
_____
_____
_____

4) Risk Management

The issue details methods to cope with project uncertainties that are inherent to each delivery method. For more detailed guidance, please see Tier 3 for risk-based approach to selecting project delivery methods.

DESIGN-BID-BUILD	
Advantages	Disadvantages
□ Provides historically well-defined and well-understood risk management processes. □ Prescriptive designs and specifications allow for greater detail in risk allocation.	□ Constructor cannot participate in risk management during design. □ Constructor's ability to manage risk is constrained by low-bid procurement.

CONSTRUCTION MANAGEMENT AT RISK	
Advantages	Disadvantages
□ Construction manager understands and participates in risk management process during design.	□ Risk management process can be more complex due to separate design, construction, and construction management contracts.

DESIGN-BUILD	
Advantages	Disadvantages
□ Single point of responsibility for risk management in design & construction.	□ Owner may lose come ability to participate in the risk management process.

Table 4 – Risk Management Advantages/Disadvantages Summary

	DBB	CMR	DB
4. Risk Management			

Key: ● Most appropriate delivery method
o Appropriate delivery method
○ Least appropriate delivery method
X Not applicable (discontinue evaluation of this method)

Comments: _____
_____
_____
_____

5) Risk Allocation

Each project delivery method has inherent risk-allocation characteristics. The overarching goal should be to select the project delivery method with the best ability to assign project risks to the parties in the best position to manage them.

DESIGN-BID-BUILD	
Advantages	Disadvantages
□ A clear risk allocation has been established due to history of use and statutory case law.	□ Constructor cannot participate in risk-allocation discussions during design. □ Conflicts can exist in risk allocation between separate design and construction contracts.

CONSTRUCTION MANAGEMENT AT RISK	
Advantages	Disadvantages
□ Construction Manager understands and participates in risk allocation during design. □ Prescriptive designs and specifications allow for greater detail in risk allocation.	□ Conflicts can exist in risk allocation between separate design, construction and construction management contracts.

DESIGN-BUILD	
Advantages	Disadvantages
□ Provides a single party for risk allocation in both design and construction. □ Design-builder owns risk for design errors and omissions.	□ Risks must be allocated through conceptual design and performance specifications.

Table 5 – Risk Allocation Advantages/Disadvantages Summary

	DBB	CMR	DB
5. Risk Allocation			

Key: ● Most appropriate delivery method
o Appropriate delivery method
○ Least appropriate delivery method
X Not applicable (discontinue evaluation of this method)

Comments: _____
_____
_____
_____

6. Agency Goals and Objectives

Agency goals define project success. The extent to which these goals align with the inherent attributes of each project delivery method has a significant bearing on delivery method selection.

DESIGN-BID-BUILD	
Advantages	Disadvantages
□ The DBB process allows for goals to be defined through the design process.	□ Separate design and construction contracts can make goals more difficult to align and manage. □ If not developed correctly, detailed designs and prescriptive specifications can conflict with agency goals.

CONSTRUCTION MANAGEMENT AT RISK	
Advantages	Disadvantages
□ Agency can involve the CMR in refinement of goals while working together to refine the scope and the GMP. □ Qualifications-based construction manager selection can align the team with the project goals.	□ The agency must have the goals substantially developed when the construction manager contract is awarded. □ The negotiation of a GMP may inhibit the alignment of project goals between the agency and the construction manager.

DESIGN-BUILD	
Advantages	Disadvantages
□ Best-value design-builder selection can align the team with the project goals. □ Properly written procurement performance criteria can help design-builders innovate to achieve project goals.	□ To ensure success, agencies must completely understand goals prior to awarding the DB contract.

Table 6 – Agency Goals and Objectives Advantages/Disadvantages Summary

	DBB	CMR	DB
6. Agency Goals and Objectives			

Key: ● Most appropriate delivery method
o Appropriate delivery method
○ Least appropriate delivery method
X Not applicable (discontinue evaluation of this method)

Comments: _____
_____
_____
_____

7) Agency Control of Project

The owner's ability to control the details of design and construction varies with each project delivery method. (Note that cost control and time control are described in other issues.)

DESIGN-BID-BUILD	
Advantages	Disadvantages
□ The use of prescriptive specifications and complete designs at the time of award provides agencies with the most control over the project. □ Separate design and construction contracts provide clear checks and balances.	□ With additional control come added activities and responsibility for agency staff. □ THE DBB method can be prone to change orders if any design conflicts or constructability issues are found.

CONSTRUCTION MANAGEMENT AT RISK	
Advantages	Disadvantages
□ The CMR method benefits from early constructor involvement, but still has the benefit of separate design and construction contracts.	□ Agency control of CMR delivery requires more effort due to the use of multiple design packages and the need for a GMP pricing structure.

DESIGN-BUILD	
Advantages	Disadvantages
□ The transfer of design liability lessens the need for agency control over design.	□ Award at a conceptual design level means that the agency will lose control over the details of the final design.

Table 7 – Agency Control of Project Advantages/Disadvantages Summary

	DBB	CMR	DB
7. Agency Control of Project			

Key: ● Most appropriate delivery method
o Appropriate delivery method
○ Least appropriate delivery method
X Not applicable (discontinue evaluation of this method)

Comments: _____
_____
_____
_____

8) Agency Control of the Project

The owner's ability to control the details of design and construction varies with each project delivery method. (Note that cost control and time control are described in other issues).

DESIGN-BID-BUILD	
Advantages	Disadvantages
□ The use of prescriptive specifications and complete designs at the time of award provides agencies with the most control over the project. □ Separate design and construction contracts provide clear checks and balances.	□ With additional control come added activities and responsibility for agency staff. □ The DBB method can be prone to change orders if any design conflicts or constructability issues are found.

CONSTRUCTION MANAGEMENT AT RISK	
Advantages	Disadvantages
□ The CMR method benefits from early constructor involvement, but still has the benefit of separate design and construction contracts.	□ Agency control of CMR delivery requires more effort due to the use of multiple design packages and the need for a GMP pricing structure.

DESIGN-BUILD	
Advantages	Disadvantages
□ The transfer of design liability lessens the need for agency control over design.	□ Award at a conceptual design level means that the agency will lose control over the details of the final design.

Table 8 – Third Party Agreement Advantages/Disadvantages Summary

	DBB	CMR	DB
8. Third Party Agreement			

Key: ● Most appropriate delivery method
o Appropriate delivery method
○ Least appropriate delivery method
X Not applicable (discontinue evaluation of this method)

Comments: _____
_____
_____
_____

9) Stakeholder/Community Input

This issue addresses the opportunity for stakeholder involvement afforded by the delivery methods.

DESIGN-BID-BUILD	
Advantages	Disadvantages
□ Separate design and construction phases give an opportunity to get stakeholders' inputs before the commencement of construction.	□ The opportunity for stakeholder changes in design can cause delays in the project and add to the costs in the form of change orders.

CONSTRUCTION MANAGEMENT AT RISK	
Advantages	Disadvantages
□ The construction experience of the construction manager can help facilitate stakeholder input.	□ Stakeholder input can make GMP negotiation troublesome if not managed correctly.

DESIGN-BUILD	
Advantages	Disadvantages
□ The owner can require the DB contractor to include a public information and outreach program to facilitate communities' inputs. □ Design-builders can be innovative in helping gain community involvement.	□ Any change because of community inputs after the issuance of RFP can be costly.

Table 9 – Stakeholder/Community Input Advantages/Disadvantages Summary

	DBB	CMR	DB
9. Stakeholder/Community Input			

Key: ● Most appropriate delivery method
o Appropriate delivery method
○ Least appropriate delivery method
X Not applicable (discontinue evaluation of this method)

Comments: _____
_____
_____
_____

10) Lifecycle Costs

Delivery methods can influence costs in the operation and maintenance phase. This issue focuses on the opportunities or barriers that each delivery method provides with regard to lifecycle costs.

DESIGN-BID-BUILD	
Advantages	Disadvantages
□ The agency can control lifecycle costs through completed design and performance specifications.	□ The DBB system allows for little constructor input into lifecycle costs.

CONSTRUCTION MANAGEMENT AT RISK	
Advantages	Disadvantages
□ CMR has all the benefits of DBB, plus the agency can leverage construction manager's input into lifecycle costs.	□ If lifecycle performance criteria are not well understood during the development of the GMP, lifecycle issues may be difficult to incorporate into the final project.

DESIGN-BUILD	
Advantages	Disadvantages
□ The agency can use performance criteria to set lifecycle performance standards and rely on design-builder innovation to achieve these standards.	□ If lifecycle performance criteria are not well understood at the procurement stage, they will not be incorporated into the DB contract.

Table 10 – Lifecycle Costs Advantages/Disadvantages Summary

	DBB	CMR	DB
10. Lifecycle Costs			

Key: ● Most appropriate delivery method
o Appropriate delivery method
○ Least appropriate delivery method
X Not applicable (discontinue evaluation of this method)

Comments: _____
_____
_____
_____

11) Maintainability

There can be advantages and disadvantages to each delivery method with regard to how maintainability is achieved. This issue describes these advantages and disadvantages as they relate to the owner's ability to specify quality and ease of maintenance.

DESIGN-BID-BUILD	
Advantages	Disadvantages
□ The opportunity to view completed plans before award allows agencies to review maintenance issues in designs.	□ There is little opportunity for constructors to have input into maintenance issues.

CONSTRUCTION MANAGEMENT AT RISK	
Advantages	Disadvantages
□ CMR has all benefits of DBB, plus the agency can leverage construction manager's input into maintenance issues.	□ If maintainability issues are not well understood during the development of the GMP, they may be difficult to incorporate into the final product.

DESIGN-BUILD	
Advantages	Disadvantages
□ The agency can emphasize maintainability issues through performance criteria and best-value award factors.	□ If maintainability issues are not well understood at the procurement stage, they will not be incorporated into the DB contract.

Table 11 – Maintainability Advantages/Disadvantages Summary

	DBB	CMR	DB
11. Maintainability			

Key: ● Most appropriate delivery method
o Appropriate delivery method
○ Least appropriate delivery method
X Not applicable (discontinue evaluation of this method)

Comments: _____
_____
_____
_____