Alternative Contracting Methods

AGC/SDDOT Transportation Summit

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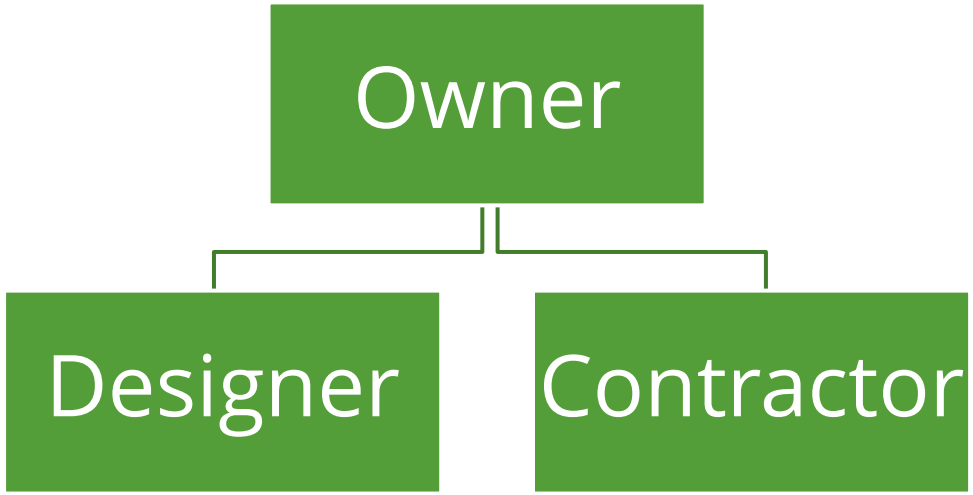
Design-Bid-Build

Traditional DBB Process

- Three separate entities
- Contractor involved after design is complete
- No contractual relationship between designer and contractor
- Linear process
- Primary delivery method by all state DOTs
- Framework embedded in typical DOT processes



DELIVERY METHOD PROCESS COMPARISON

Alternative Contracting Methods

What are ACMs?

- Alternatives to the traditional Design-Bid-Build contracting method using combinations of price and non-price parameters such as qualifications, experience, schedule, and approach to select project teams.
- Methods aggregate design and construction and foster collaboration in different ways.
- Three main ACMs used in highway construction:
  - Design-Build (DB)
  - Construction Manager/General Contractor (CMGC)
  - Progressive Design-Build (PDB)

History of ACM Use by State DOTs

Why do DOTs use ACMs?

- Solve complex problems
- Schedule
- Budget
- Undefined Scope
- Risk Allocation
- Phasing/ Packaging
- Third Party/ ROW
- Maintenance of Traffic
- Innovation
- Agency Capacity

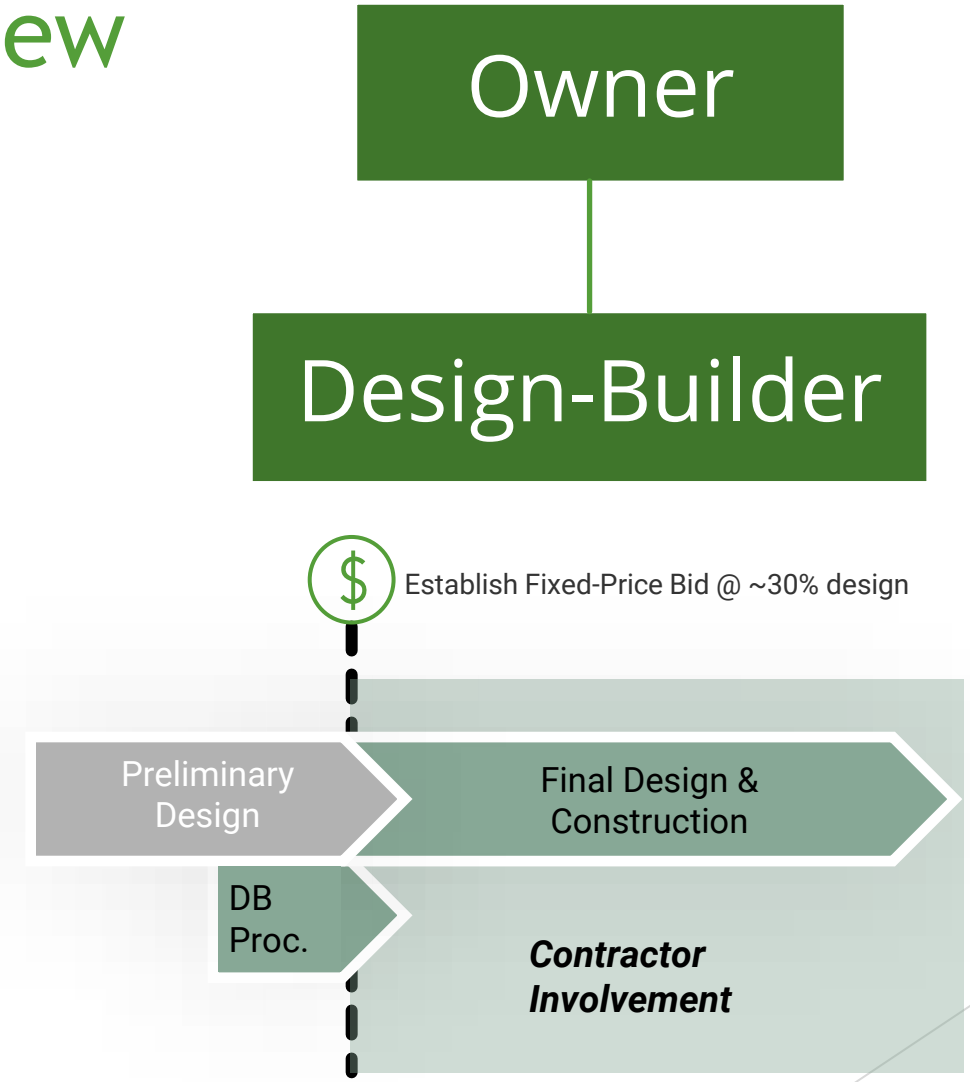
Design-Build (DB)

Use of DB for Federally Funded Projects

- The National Road, built between 1811 and 1834, was the first federally funded road in the United States. It was also the first federally funded road to be designed and built under a single contract.
- State DOTs began widely adopting DB in the late 1980s and early 1990s.
- The Federal Highway Administration (FHWA) published the final rule for design-build contracting in 23 CFR Part 636 on December 10, 2002. This rule was published in response to section 1307 of TEA-21.
- DB gained significant momentum and became more prevalent following the passage of the SAFETEA-LU Act in 2005, which included provisions specifically supporting design-build contracting at the state level.
- The rule was revised in 2007 in response to section 1503 of SAFETEA-LU. These revisions included:
  - Eliminating dollar thresholds for "qualified" projects
  - Allowing a Request for Proposals (RFP) or DB contract to be released before completing NEPA

Design-Build Overview

- Designer and contractor are on the same team
- Innovations through Alternative Technical Concepts (ATCs) during procurement
- Contractor participates in preconstruction phase
- Construction cost determined prior to award of DB team



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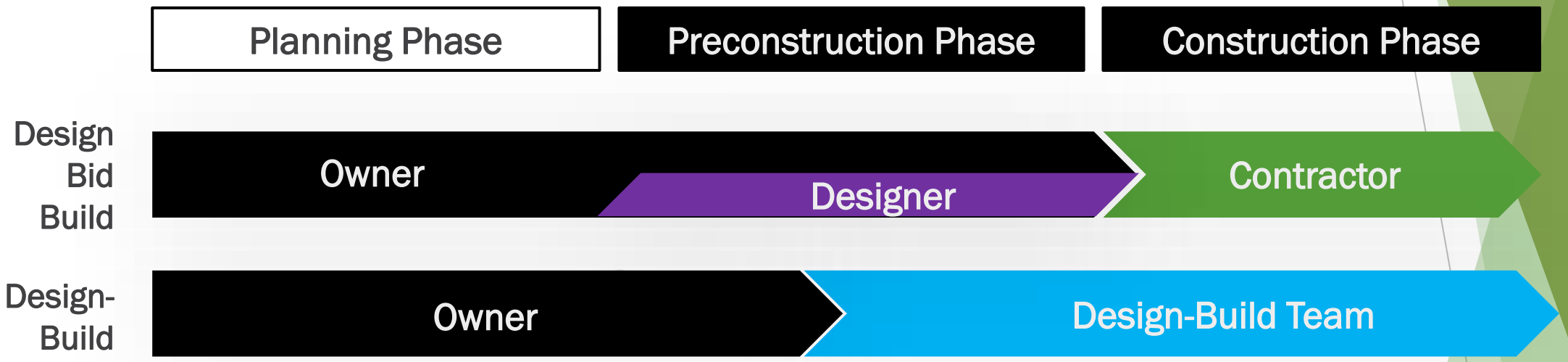


Typical DB Procurement Processes

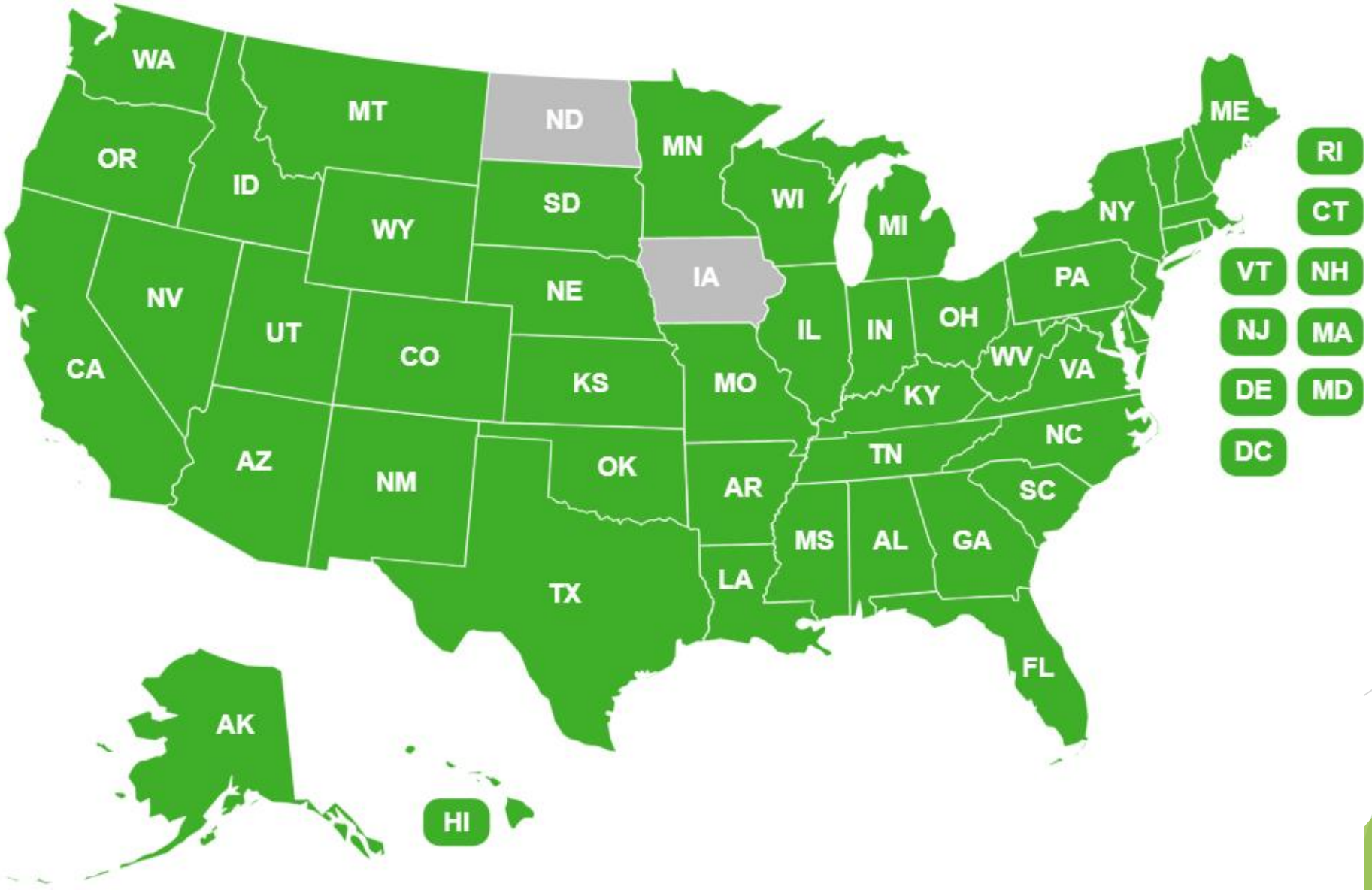
- One-step or two-step procurement
- Proposer questions
- One-on-one meetings
- Alternative technical concepts (ATCs)
- Best value or low bid
- Proposal discussions and revisions / BAFO

Advantages and Challenges

- Fixed Price known at DB selection
- Designer and contractor on one team
- Can facilitate innovation
- Can provide for schedule acceleration

- Achieving effective risk allocation can be challenging
- Price may include large contingencies for risks
- Limits ability for owner to direct design
- Puts owner decision making on the critical path during design

What DOTs use or have used DB?



Considerations When Selecting DB

- Does the effort to define the scope and requirements for the project align with the size of the project?
- Can major risks be mitigated prior to contract award or a fair approach to dealing with risks be established in the design-build contract?
- Do innovation opportunities exist that do not require significant deviation from typical standards?
- Does the DOT have capacity to perform design reviews and other project oversight in a timely manner?

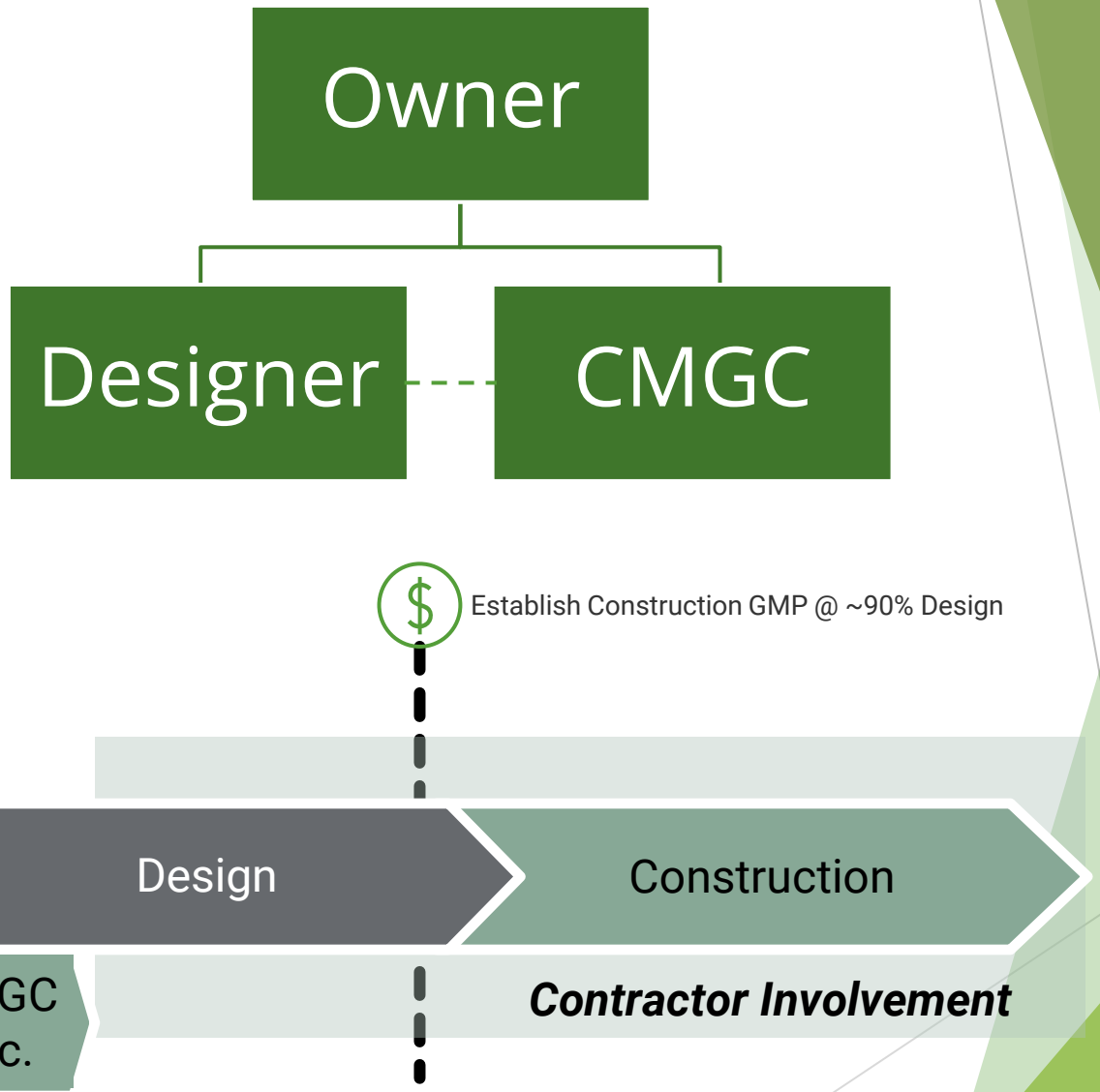
- Construction Manager/ General Contractor (CMGC)

Use of CMGC for Federally Funded Projects

- The SEP-14 program allowed states to try out the CMGC approach, which was considered innovative at the time, to see if it could improve project quality, cost, and schedule compared to traditional design-bid-build methods.
- There was limited use of CMGC by state DOTs through the SEP-14 program.
- FHWA published the final rule for CMGC contracting in 23 CFR Part 635 on December 2, 2016. This rule was published in response to Section 1303 of the Moving Ahead for Progress in the 21st Century Act (MAP-21).
- Even following the publishing of the final rule, CMGC did not immediately gain significant use by state DOTs. Use has increased significantly over the last five years.

CMGC Overview

- Designer and contractor are contractually obligated
- Contractor participates in preconstruction phase
- Innovations through contractor involvement during preconstruction
- Guaranteed Maximum Price (GMP) developed prior to construction award
- If GMP cannot be agreed to by all parties, the DOT may exercise an “off-ramp” to terminate the Contract



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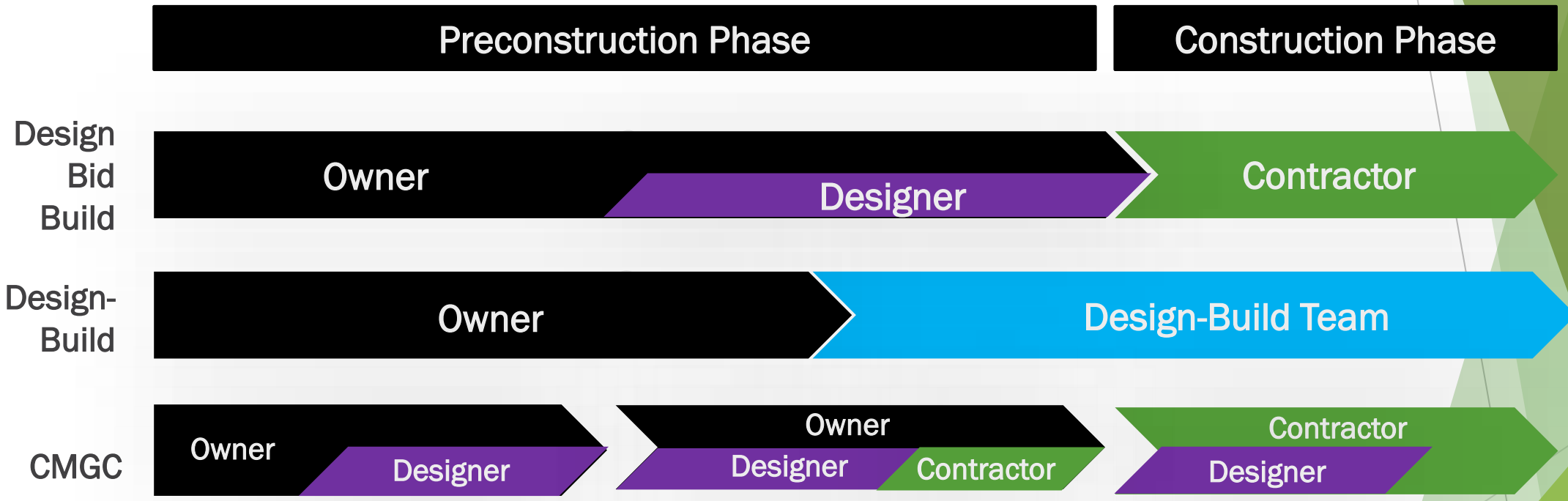


Typical CMGC Procurement Processes

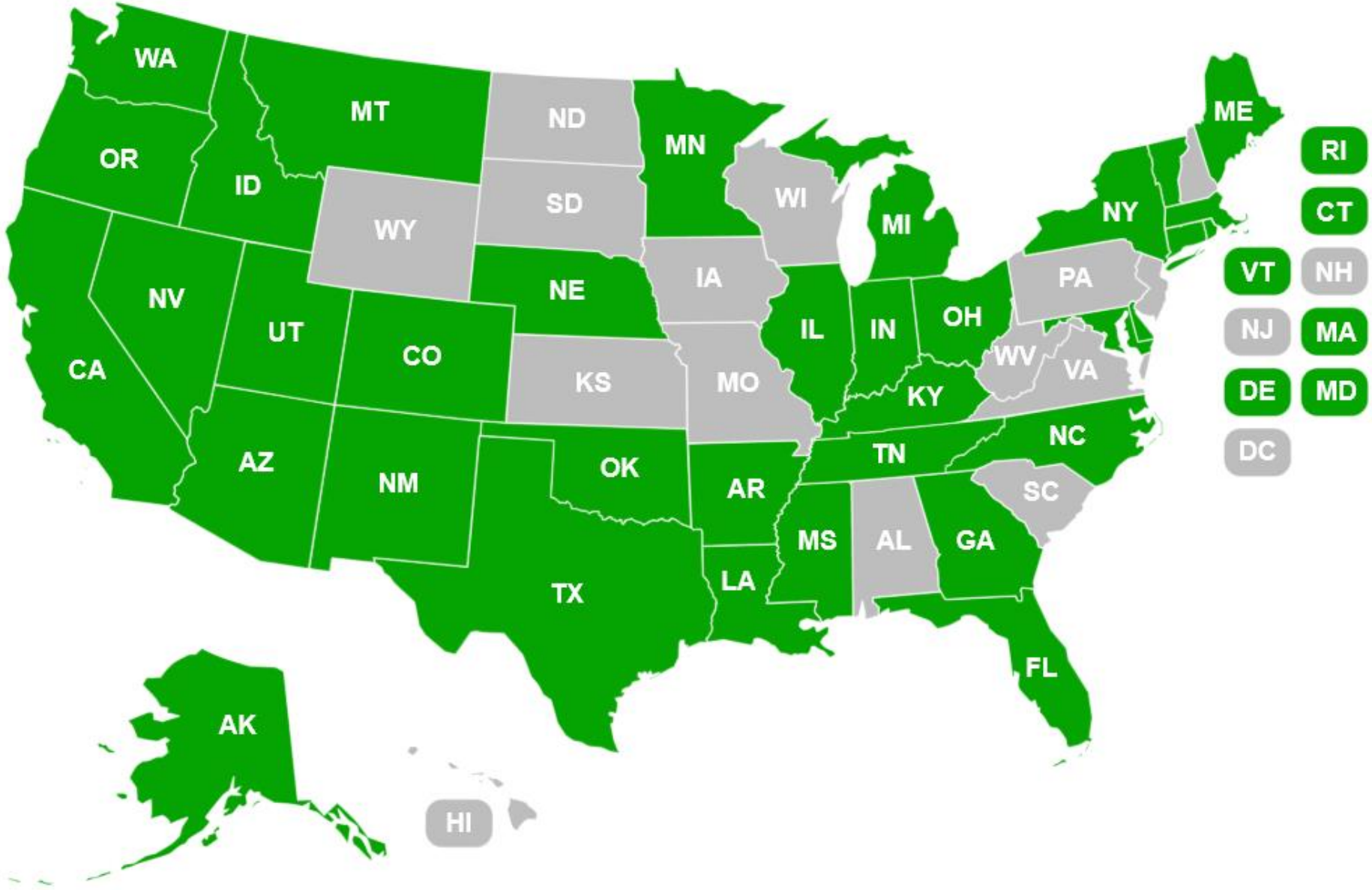
- One-step or two-step procurement (one-step recommended)
- Proposer questions
- One-on-one meetings (less important than for DB)
- Interviews with Proposers
- QBS or Best Value (QBS recommended)

Advantages and Challenges

- Can build means and methods into design plans
- Savings from innovations can be put back into the project as additional scope
- Options for early work packages can mitigate risks
- Can provide for greater cost and schedule certainty once GMP is agreed to

- Managing designer / contractor interface can be challenging
- Collaboration during the preconstruction phase increases admin costs
- Negotiating pricing can be challenging
- Price and schedule certainty not known at the time of award

What DOTs use or have used CMGC?



Considerations When Selecting CMGC

- Is the project scope difficult to define?
- Are there major risks that can not be mitigated prior to contract award?
- Would contractor involvement in the design improve project value?
- Do contractor means and methods drive design decisions?
- Do innovation opportunities exist that require significant deviation from typical standards?

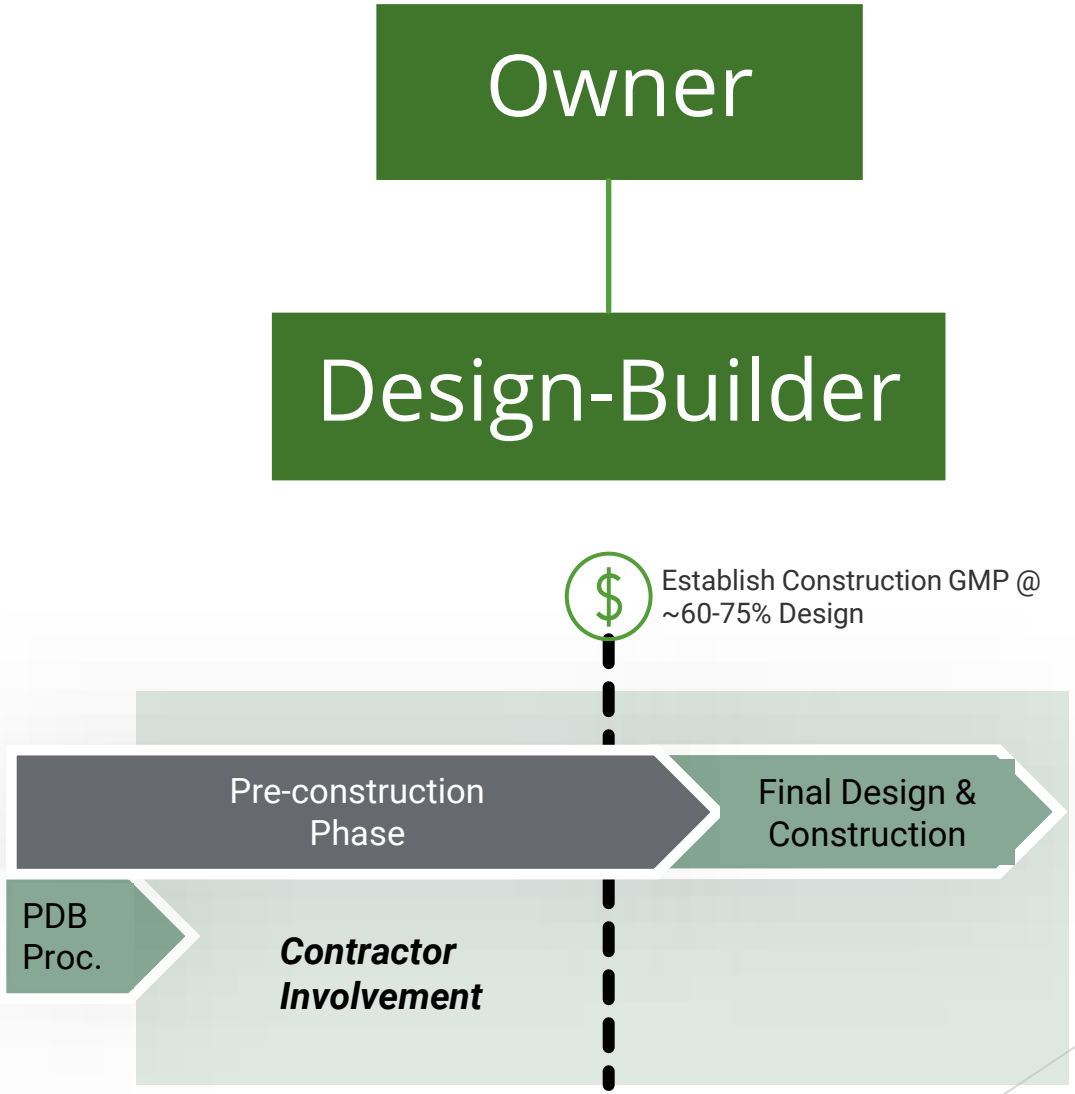
Progressive Design-Build

History of PDB for Federally Funded Projects

- Federal authorization for PDB depends on whether NEPA is complete when the PDB contract is executed.
- Revisions to the DB rule in 23 CFR 636 made in 2007 to allow an RFP or DB contract to be released before completing NEPA also provided for open book pricing in the event that this process was followed providing a mechanism for PDB implementation.
- This approach has been taken by several states that have delivered PDB projects.
- If NEPA has been completed, states may still use PDB through SEP-14 program.
- This approach has also been taken by several states that have delivered PDB projects.
- Like CMGC, use of PDB has increased significantly over the last five years.

PDB Overview

- Designer and contractor are on the same team
- Contractor participates in preconstruction phase
- Innovations through contractor involvement during preconstruction
- Guaranteed Maximum Price (GMP) developed prior to construction award
- If GMP cannot be agreed to by all parties, the DOT may exercise an “off-ramp” to terminate the Contract



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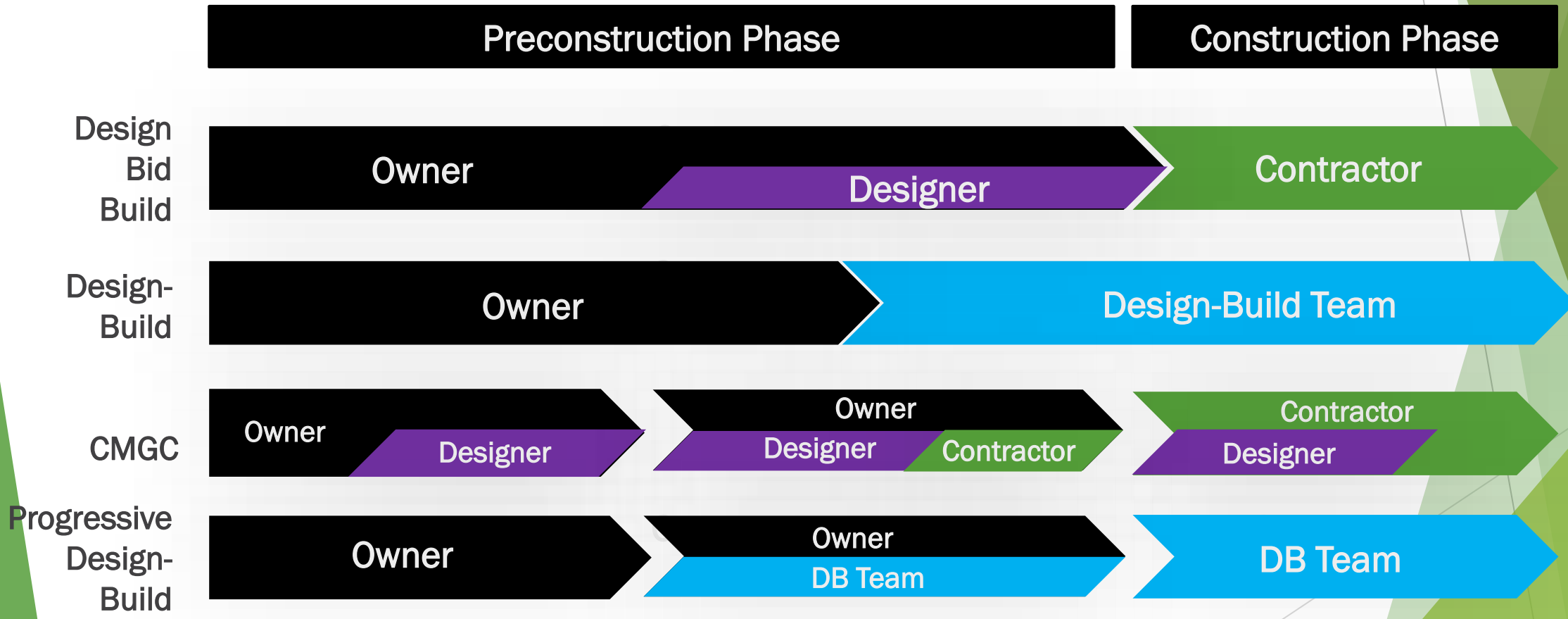


Typical PDB Procurement Processes

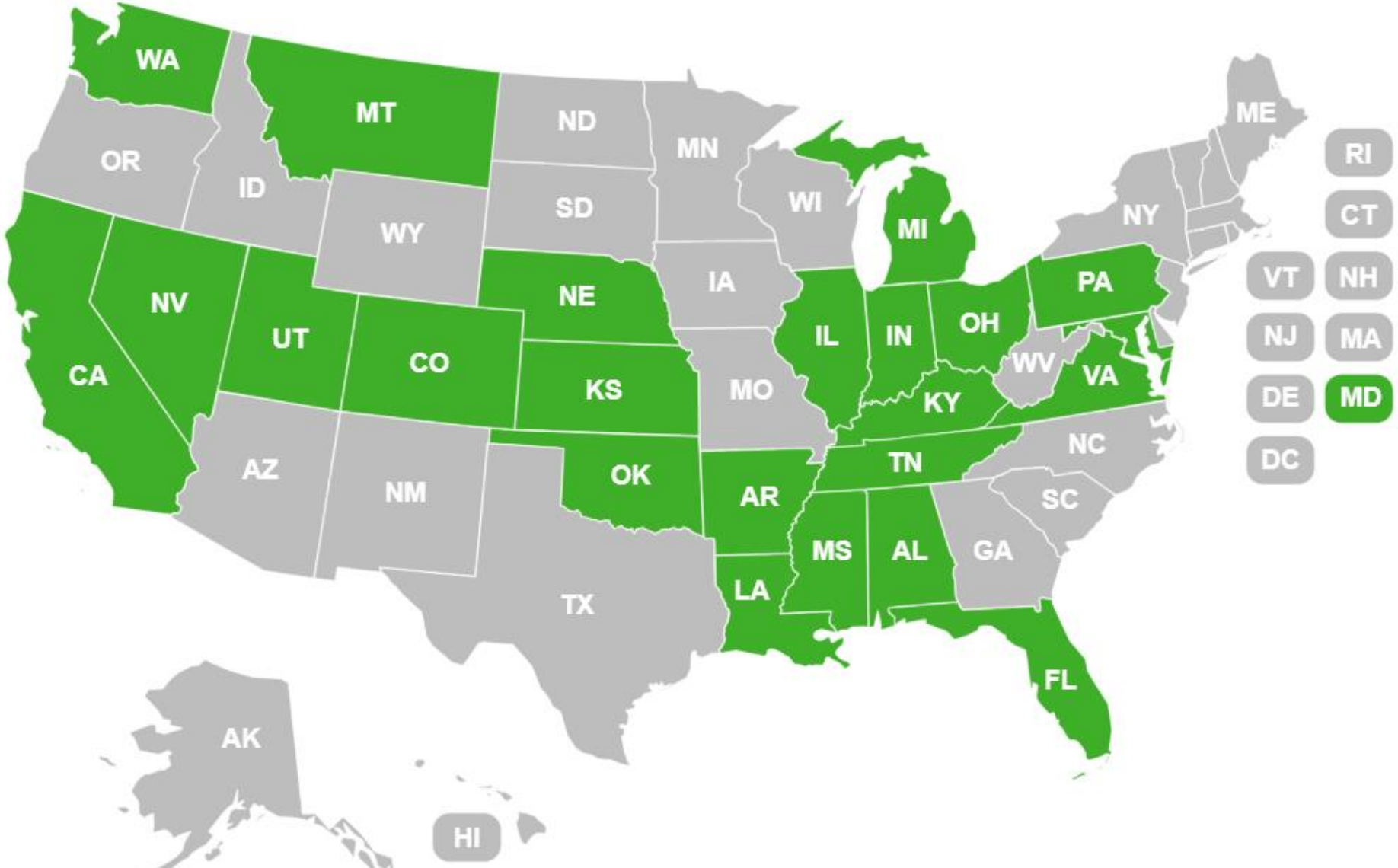
- One-step or two-step procurement (one-step recommended)
- Proposer questions
- One-on-one meetings (less important than for DB)
- Interviews with Proposers
- QBS or Best Value (QBS recommended)

Advantages and Challenges

- Allows contractor and designers to pick their teams based on known relationships
- Savings from innovations can be put back into the project as additional scope
- Options for early work packages can mitigate risks
- Can provide for greater cost and schedule certainty once GMP is agreed to

- Collaboration during the preconstruction phase increases admin costs
- Negotiating pricing can be challenging
- Price and schedule certainty not known at the time of award

Who uses or has used PDB?



Considerations When Selecting PDB

- Is the project scope difficult to define?
- Are there major risks that can not be mitigated prior to contract award?
- Would contractor involvement in the design improve project value?
- Do contractor means and methods drive design decisions?
- Do innovation opportunities exist that require significant deviation from typical standards?

- CMGC / PDB Key Elements
  Risk Register

Risk Register Overview

- Hub of the preconstruction phase
- Use evolves through the preconstruction phase
- Allows for granular and proactive allocation of risks and identification of risk specific contingency (provisional sums)
- Becomes a contract document
- Primary driver of project value

Sample Risk Register

DAILY OVERHEAD RATE: $ 10,000.00 **RISK RESERVE:** $ 80,000.00 **TIME IMPACTS:** 4.5 Days

PROJECT NAME: (PROJECT NAME)
PROJECT NUMBER: (#####-##)
DATE: (DATE)

RISK #	RISK NAME	DESCRIPTION	STATUS (Active or Retired)	OWNER	CHAMPION(S)	PROBABILITY	COST IMPACT	WEIGHTED COST	TIME IMPACT	WEIGHTED TIME	MITIGATION STRATEGY	RESOLUTION	TRIGGER TO ENGAGE RISK RESERVE
T1	Adjacent Project Coordination	Adjacent projects could impact MOT and increase cost/time.	Retired	CMGC	(name)	25%	$ -	$ -	0	0	Carry projected cost impact in risk register to give us flexibility. Will know more about timing as we approach final design.	Retired: No significant impacts from adjacent projects are anticipated.	N/A
T2	Escalation - Project Delays	Current market conditions could cause cost increases if the project is delayed	Retired	CMGC	(name)	25%	$ -	$ -	0	0	Carry contingency in risk register initially. Risk item will be retired once we receive sub and material bids. Coordinate with Subs to ensure timeframes are understood. Review possibility of early work package for material procurement.	Retired: Contingency has been zeroed out. Final sub and materials bids included any anticipated escalation risks. GMP bid incorporated the final sub and materials bids.	N/A
T3	Railroad - Flagging	Are we going to need RR flaggers? Are they available?	Retired	Owner	(name)	100%	$ -	$ -	0	0	Coordinate duration and quantity of flaggers needed with RR.	Retire risk: ArDOT pays cost for RR flaggers directly. Flaggers are available for project.	N/A
T4	Unknown Utilities	Unexpected construction conflicts with exisiting utilities	Active	CMGC	(name)	25%	$ 100,000.00	$ 25,000.00	14	3.5	Carry contingency in the risk register. Potentially use force account payment. (3/1/2021 Update) Air bridging or matting over existing utilities could add cost and time.	Contractor will be paid on a force account basis for relocation of the utility in conflict. Time impacts will be awarded only if the utility conflict impacts the project critical path.	Contractor discoveres a conflict with an existing underground utility that was not identified during preconstruction phase.
T5	Unsuitable Soil Disposal	Unknown site conditions - contaminated materials, unsuitable soils that would need to be hauled off and disposed.	Active	CMGC	(name)	10%	$ 100,000.00	$ 10,000.00	10	1	Contaminated material would be a cost for removal and disposal. Provisional sum at $150 per cubic yard... (updated 3/1/2021).	Use provisional sum. Time impacts will only be awarded if the project critical path is impacted.	Contaminated or unsuitable soils are discovered during construction and ARDOT instructed the CMGC to remove and dispose of material.

- CMGC PDB Key Elements *GMP Development*

Independent Cost Estimator

- Protect public interest in price negotiation process
- Participation during milestone pricing
- Develop bottom-up estimates using open book estimating
  - HCSS software (commonly used by ICEs)
  - Allows open, transparent comparison that can be compared to the independent cost estimate
- Attend regular task force meetings
  - Contractor/Design-Builder, ICE, Owner

Pricing Process

- Pricing milestones and ongoing reconciliation
- Pricing Milestone Process
  - Plan Review ➔ Risk Workshop ➔ Quantity Rec ➔ Price Rec
- Upon GMP agreement, contract is finalized and executed

Sample Quantity Reconciliation Form

(PROJECT NAME)
(PROJECT NUMBER)
(DATE)

BID ITEM NO.	CONTRACT ITEM DESCRIPTION	UNIT	DESIGNER QUANTITIES		CONTRACTOR QUANTITIES		ICE QUANTITES		AGREED QUANTITIES		ACTIONS		
			QUANTITY	NOTES	QUANTITY	NOTES	QUANTITY	NOTES	QUANTITY	NOTES	Who	What	When
210210	UNCLASSIFIED EXCAVATION	CY											
210433	SELECT GRANULAR BACKFILL	CY											
210601	COMPACTED EMBANKMENT	CY											
303107	AGGREGATE BASE COURSE (CLASS 7)	TON											
309005	PORTLAND CEMENT CONCRETE BASE (5" UNIFORM THICKNESS)	SY											
309008	PORTLAND CEMENT CONCRETE BASE (8" UNIFORM THICKNESS)	SY											
309022	PORTLAND CEMENT CONCRETE BASE (3" UNIFORM THICKNESS)	SY											
401011	TACK COAT	GAL											
405161	MINERAL AGGREGATE IN ACHM BASE COURSE (1 1/2")	TON											
405412	ASPHALT BINDER (PG 70-22) IN ACHM BASE COURSE (1 1/2") (MINIMUM BID $120.00)	TON											
406161	MINERAL AGGREGATE IN ACHM BINDER COURSE (1")	TON											
406412	ASPHALT BINDER (PG 70-22) IN ACHM BINDER COURSE (1") (MINIMUM BID $120.00)	TON											
407162	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")	TON											
407452	ASPHALT BINDER (PG 76-22) IN ACHM SURFACE COURSE (1/2") (MINIMUM BID $120.00)	TON											
412001	COLD MILLING ASPHALT PAVEMENT	SY											
502001	REINFORCING STEEL FOR PAVEMENT (BARS)	LBS											
503013	CONTINUOUSLY REINFORCED CONCRETE PAVEMENT (13" UNIFORM THICKNESS)	SY											
504001	APPROACH SLABS	CY											
504261	APPROACH GUTTERS	CY											
505001	PORTLAND CEMENT CONCRETE DRIVEWAY	SY											

Sample OPCC Comparison Form

(PROJECT NAME)
(PROJECT NUMBER)
(DATE)

				CM/GC		ICE				
Item	Description	UoM	Qty	Unit Price	Total	Unit Price	Total	% Difference	Price Delta	Divergence (in/out of range)
210210	UNCLASSIFIED EXCAVATION	CY	138,017	$ 16.00	$ 2,208,272.00	$ 17.00	$ 2,346,289.00	-6.25%	$ (138,017.00)	**Outside Range**
210433	SELECT GRANULAR BACKFILL	CY	34,722	$ 74.00	$ 2,569,428.00	$ 55.00	$ 1,909,710.00	25.68%	$ 659,718.00	Outside Range
210601	COMPACTED EMBANKMENT	CY	175,547	$ 22.00	$ 3,862,034.00	$ 17.00	$ 2,984,299.00	22.73%	$ 877,735.00	Outside Range
303107	AGGREGATE BASE COURSE (CLASS 7)	TON	22,969	$ 42.00	$ 964,698.00	$ 35.00	$ 803,915.00	16.67%	$ 160,783.00	Outside Range
309005	PORTLAND CEMENT CONCRETE BASE (5" UNIFORM THICKNESS)	SY	440	$ 88.00	$ 38,720.00	$ 73.00	$ 32,120.00	17.05%	$ 6,600.00	Outside Range
309008	PORTLAND CEMENT CONCRETE BASE (8" UNIFORM THICKNESS)	SY	5,268	$ 108.00	$ 568,944.00	$ 73.00	$ 384,564.00	32.41%	$ 184,380.00	Outside Range
309022	PORTLAND CEMENT CONCRETE BASE (3" UNIFORM THICKNESS)	SY	1,091	$ 14.00	$ 15,274.00	$ 73.00	$ 79,643.00	-421.43%	$ (64,369.00)	Outside Range
401011	TACK COAT	GAL	18,105	$ 4.00	$ 72,420.00	$ 4.00	$ 72,420.00	0.00%	$ -	Within Range
405161	MINERAL AGGREGATE IN ACHM BASE COURSE (1 1/2")	TON	29,751	$ 95.00	$ 2,826,345.00	$ 93.00	$ 2,766,843.00	2.11%	$ 59,502.00	Within Range
405412	ASPHALT BINDER (PG 70-22) IN ACHM BASE COURSE (1 1/2") (MINIMUM BID $120.00)	TON	1,210	$ 145.00	$ 175,450.00	$ 143.00	$ 173,030.00	1.38%	$ 2,420.00	Within Range
406161	MINERAL AGGREGATE IN ACHM BINDER COURSE (1")	TON	14,574	$ 100.00	$ 1,457,400.00	$ 107.00	$ 1,559,418.00	-7.00%	$ (102,018.00)	Outside Range
406412	ASPHALT BINDER (PG 70-22) IN ACHM BINDER COURSE (1") (MINIMUM BID $120.00)	TON	653	$ 155.00	$ 101,215.00	$ 143.00	$ 93,379.00	7.74%	$ 7,836.00	Outside Range
407162	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")	TON	39,106	$ 117.00	$ 4,575,402.00	$ 107.00	$ 4,184,342.00	8.55%	$ 391,060.00	Outside Range
407452	ASPHALT BINDER (PG 76-22) IN ACHM SURFACE COURSE (1/2") (MINIMUM BID $120.00)	TON	2,104	$ 165.00	$ 347,160.00	$ 143.00	$ 300,872.00	13.33%	$ 46,288.00	Outside Range
412001	COLD MILLING ASPHALT PAVEMENT	SY	31,158	$ 5.00	$ 155,790.00	$ 6.00	$ 186,948.00	-20.00%	$ (31,158.00)	Outside Range
502001	REINFORCING STEEL FOR PAVEMENT (BARS)	LBS	372,970	$ 2.00	$ 745,940.00	$ 2.00	$ 745,940.00	0.00%	$ -	Within Range
503013	CONTINUOUSLY REINFORCED CONCRETE PAVEMENT (13" UNIFORM THICKNESS)	SY	9,815	$ 143.00	$ 1,403,545.00	$ 86.00	$ 844,090.00	39.86%	$ 559,455.00	Outside Range
504001	APPROACH SLABS	CY	781	$ 588.00	$ 459,228.00	$ 545.00	$ 425,645.00	7.31%	$ 33,583.00	Outside Range
504261	APPROACH GUTTERS	CY	81	$ 1,088.00	$ 88,128.00	$ 1,124.00	$ 91,044.00	-3.31%	$ (2,916.00)	Within Range
505001	PORTLAND CEMENT CONCRETE DRIVEWAY	SY	1,424	$ 105.00	$ 149,520.00	$ 68.00	$ 96,832.00	35.24%	$ 52,688.00	Outside Range
	Subtotal				**$ 22,784,913.00**		**$ 20,081,343.00**	11.87%	**$ 2,703,570.00**	Outside Range
	Contractor Fee		1%		$ 227,849.13		$ 200,813.43	11.87%	$ 27,035.70	Outside Range
	Total				**$ 23,012,762.13**		**$ 20,282,156.43**	11.87%	**$ 2,730,605.70**	Outside Range
	CMGC Risk Register	LS	1	$ 850,000.00	$ 850,000.00	$ 850,000.00	$ 850,000.00	0.00%	$ -	Within Range
	Budget Total				**$ 23,862,762.13**		**$ 21,132,156.43**	11.44%	**$ 2,730,605.70**	Outside Range

Open Discussion and Questions

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