

Thursday, April 22, 2021

Design-Build Considerations for the Geoprofessional: Helping You Manage Risk



Presenter:

Kimball Olsen, P.E., DBIA

Senior Geotechnical Engineer - Kiewit Engineering Group



Moderator

Joel G. Carson

Executive Director

Geoprofessional Business Association



Kiewit

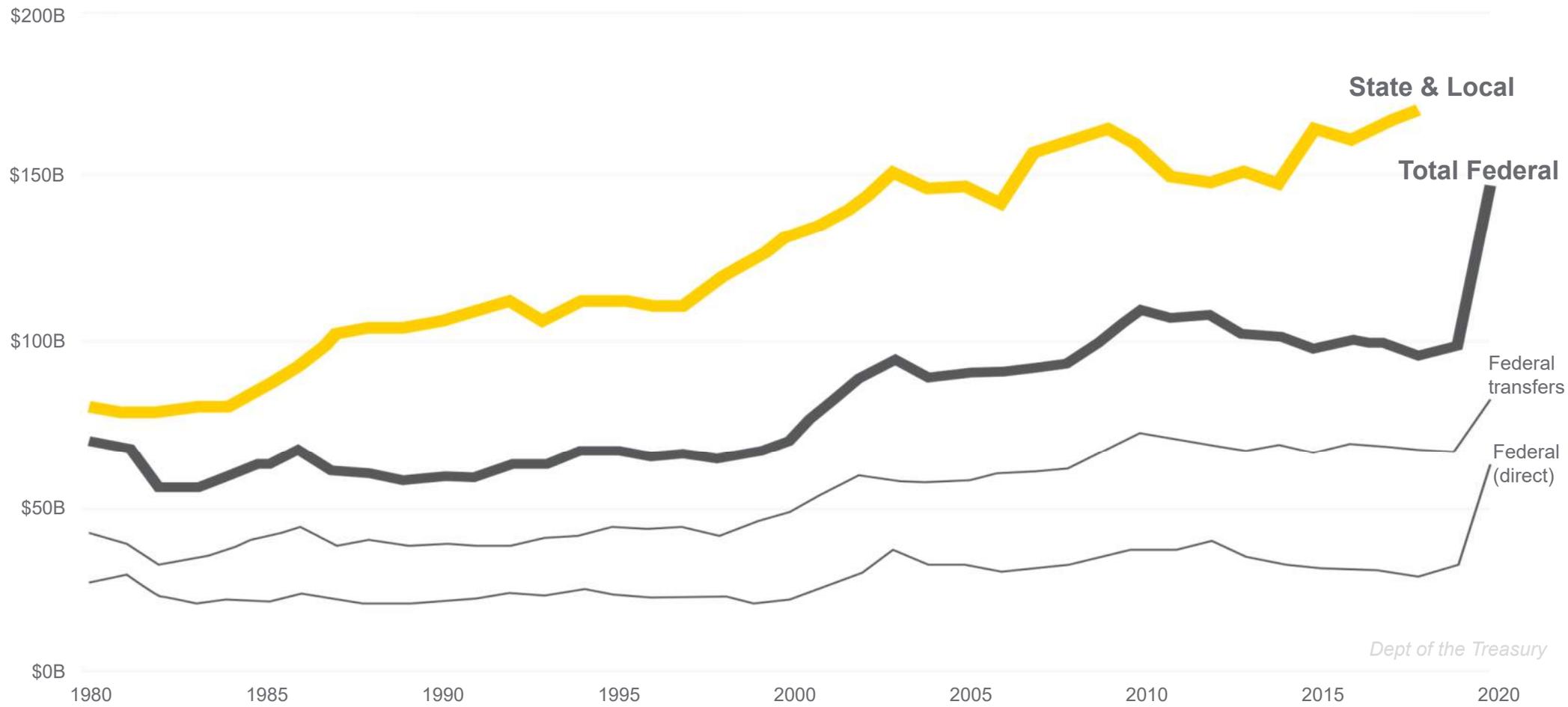
DESIGN-BUILD CONSIDERATIONS FOR THE GEOPROFESSIONAL

AGENDA

- ✓ Observations regarding the transportation market
- ✓ Challenges in design-build delivery (brief discussion)
- ✓ Kiewit approach to integrated design-build delivery
- ✓ Rise of progressive design-build

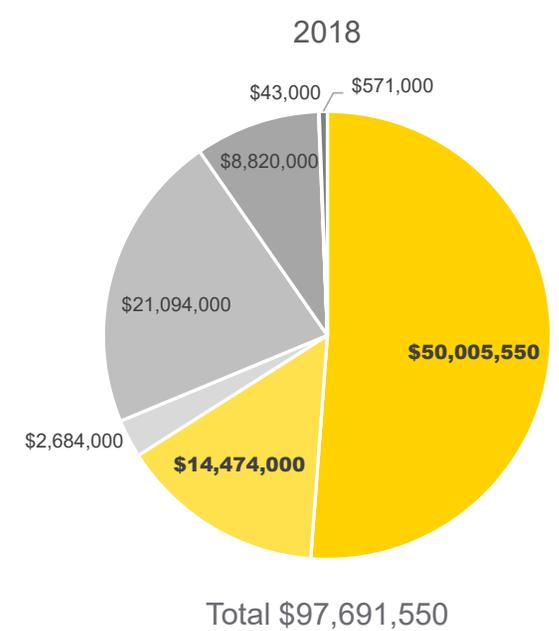
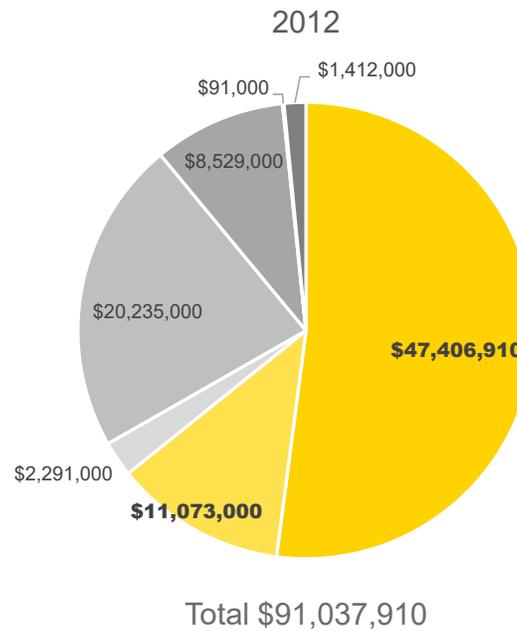
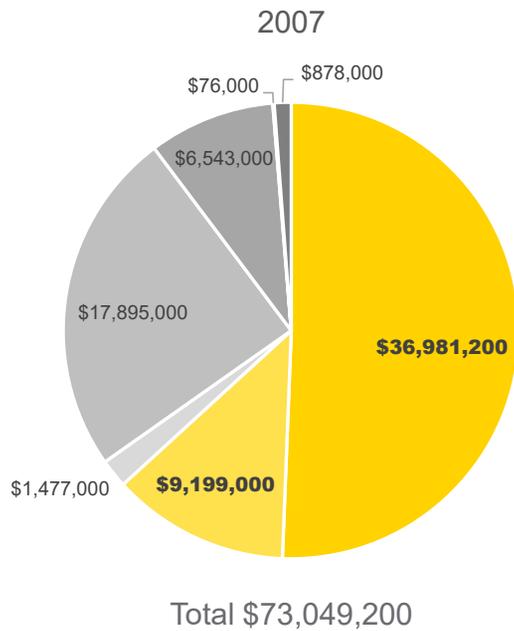


FEDERAL TRANSPORTATION SPENDING



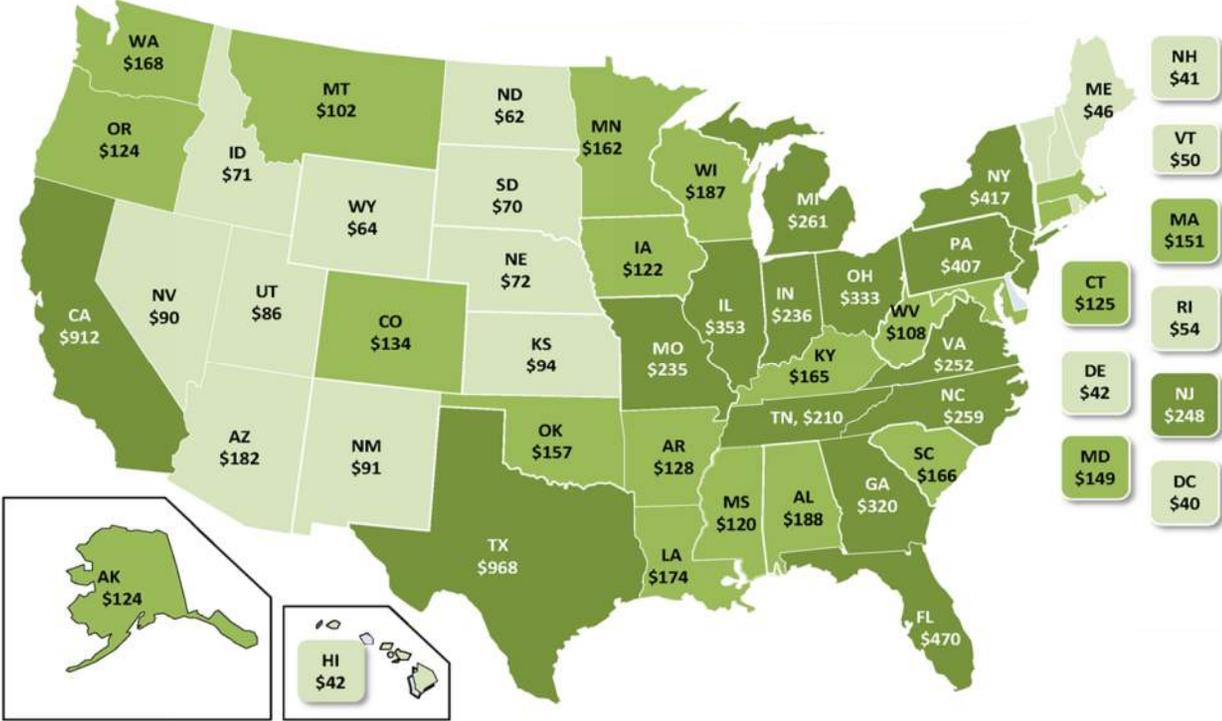
Dept of the Treasury

TRANSPORTATION EXPENDITURE BY MODE



■ Highway
 ■ Transit
 ■ Railroad
 ■ Air
 ■ Water
 ■ Pipeline
 ■ General Support

RELIEF FUNDS BY STATE



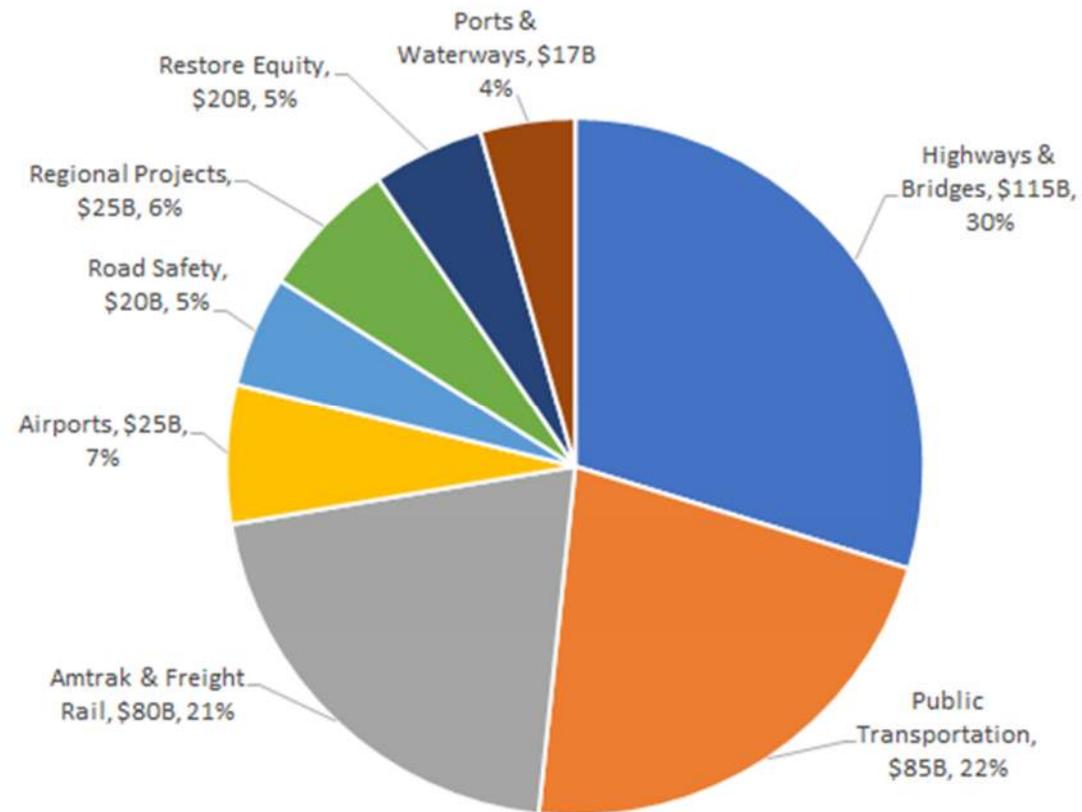
Above \$200 million in relief funds

\$100 to \$199 million in relief funds

Up to \$100 million in supplemental funds

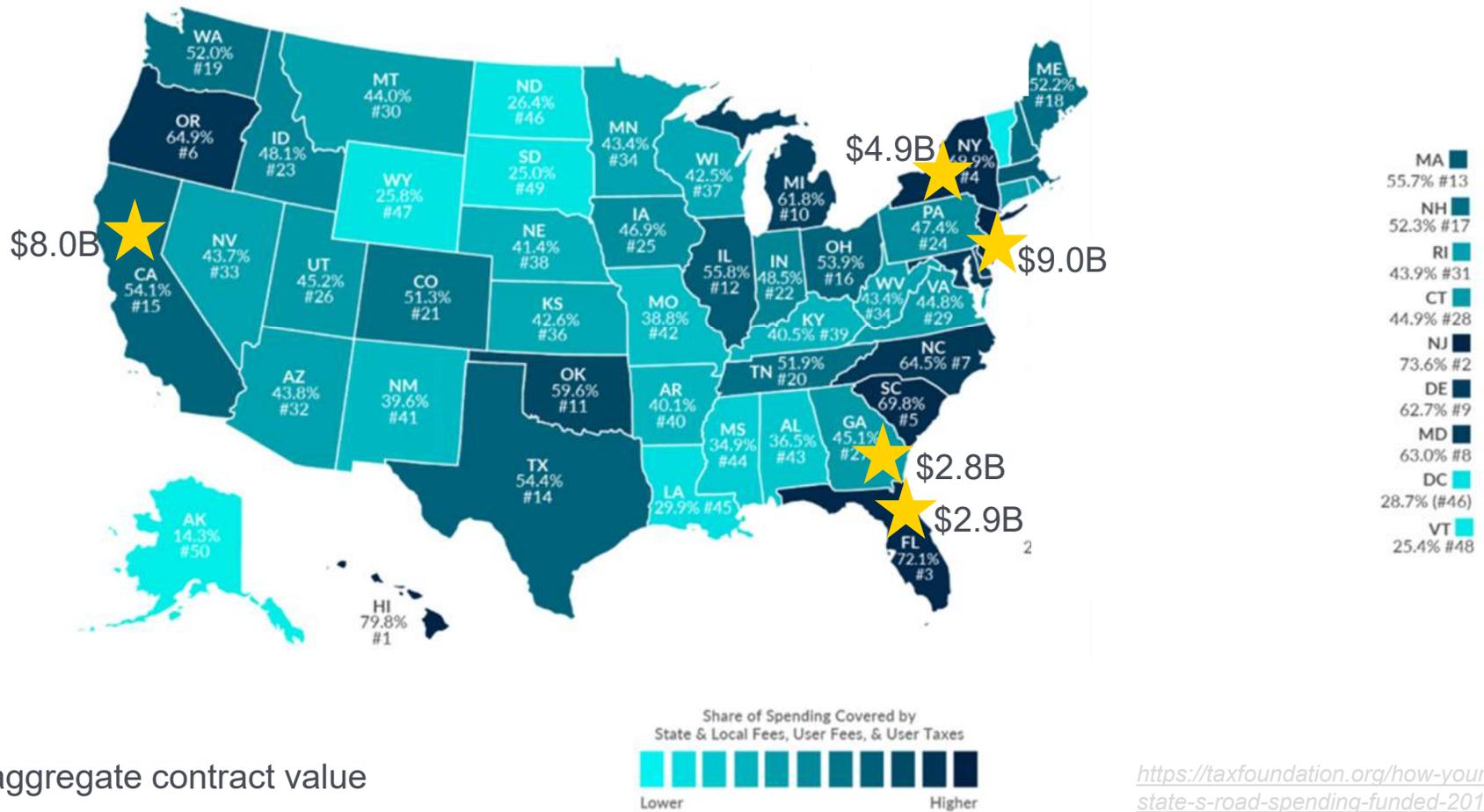
POTENTIAL INFRASTRUCTURE PACKAGE

- ✓ Biden Administration Infrastructure Plan
- ✓ \$387B for transportation improvements
 - \$115B – Highways and Bridges
 - \$85B – Public Transportation
 - \$80B – Amtrak and Freight Rail
 - \$25B – Airports



Graphic: American Road & Transportation Builders Association (ARTBA)

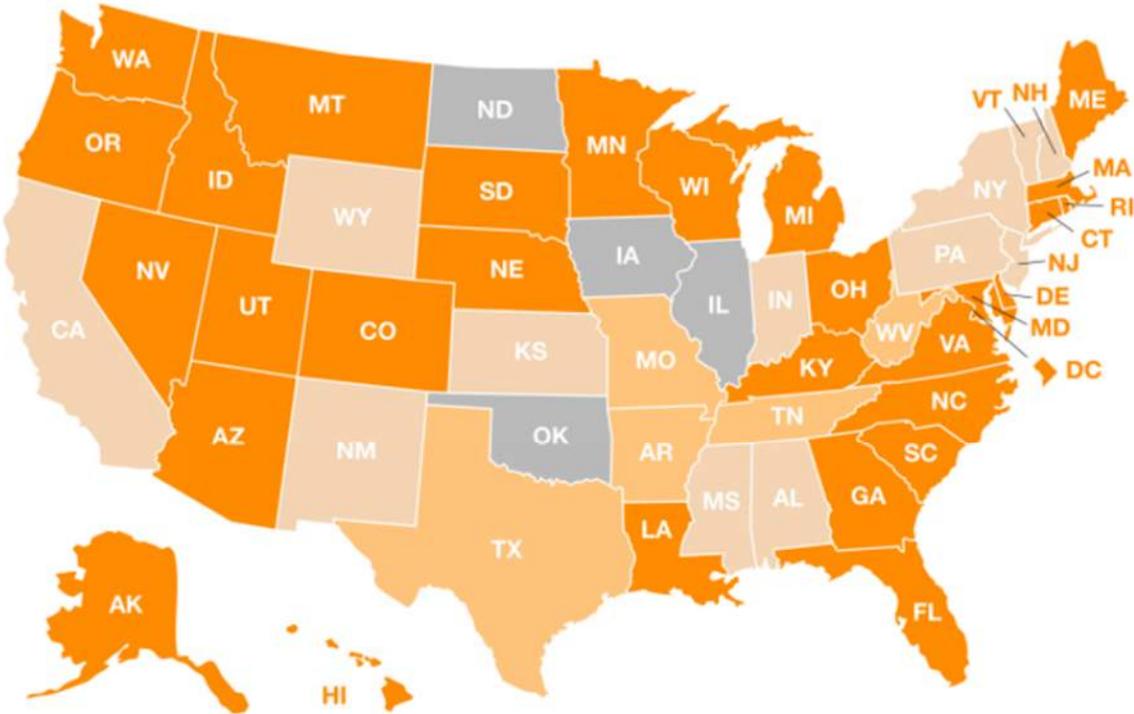
KIEWIT TRANSPORTATION PIPELINE



★ Top 5 States by aggregate contract value

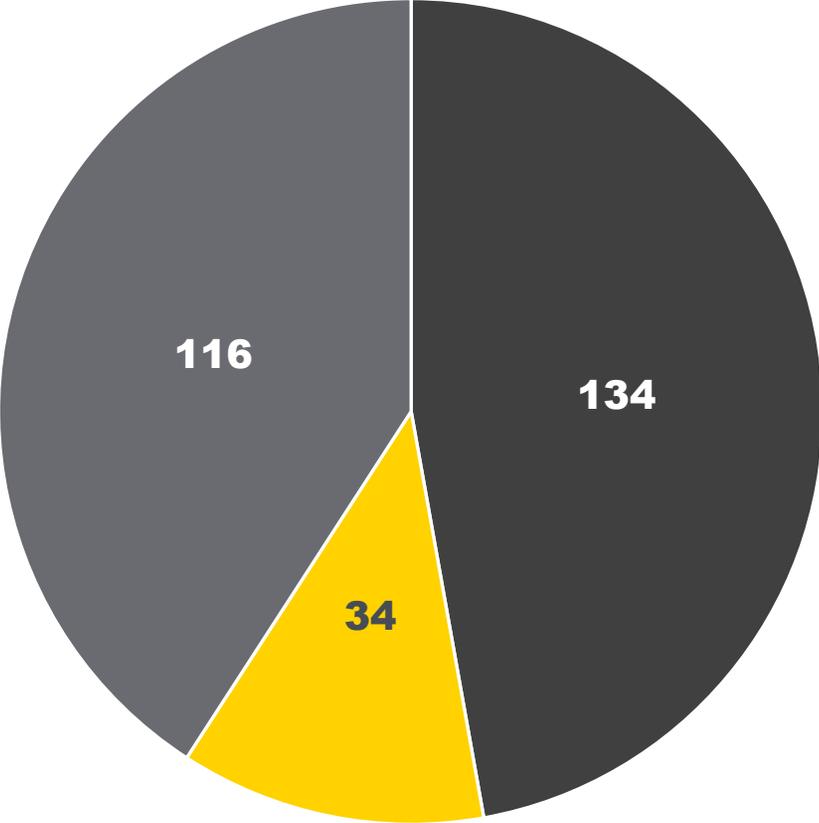
Questions

DESIGN-BUILD AUTHORIZATION FOR TRANSPORTATION

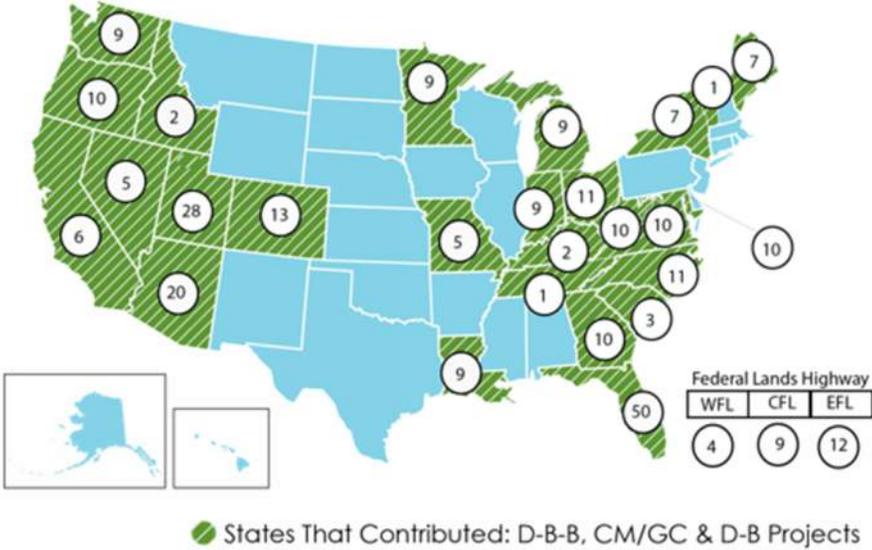


DBIA

CONTRACT PERFORMANCE IN US HWY CONSTRUCTION



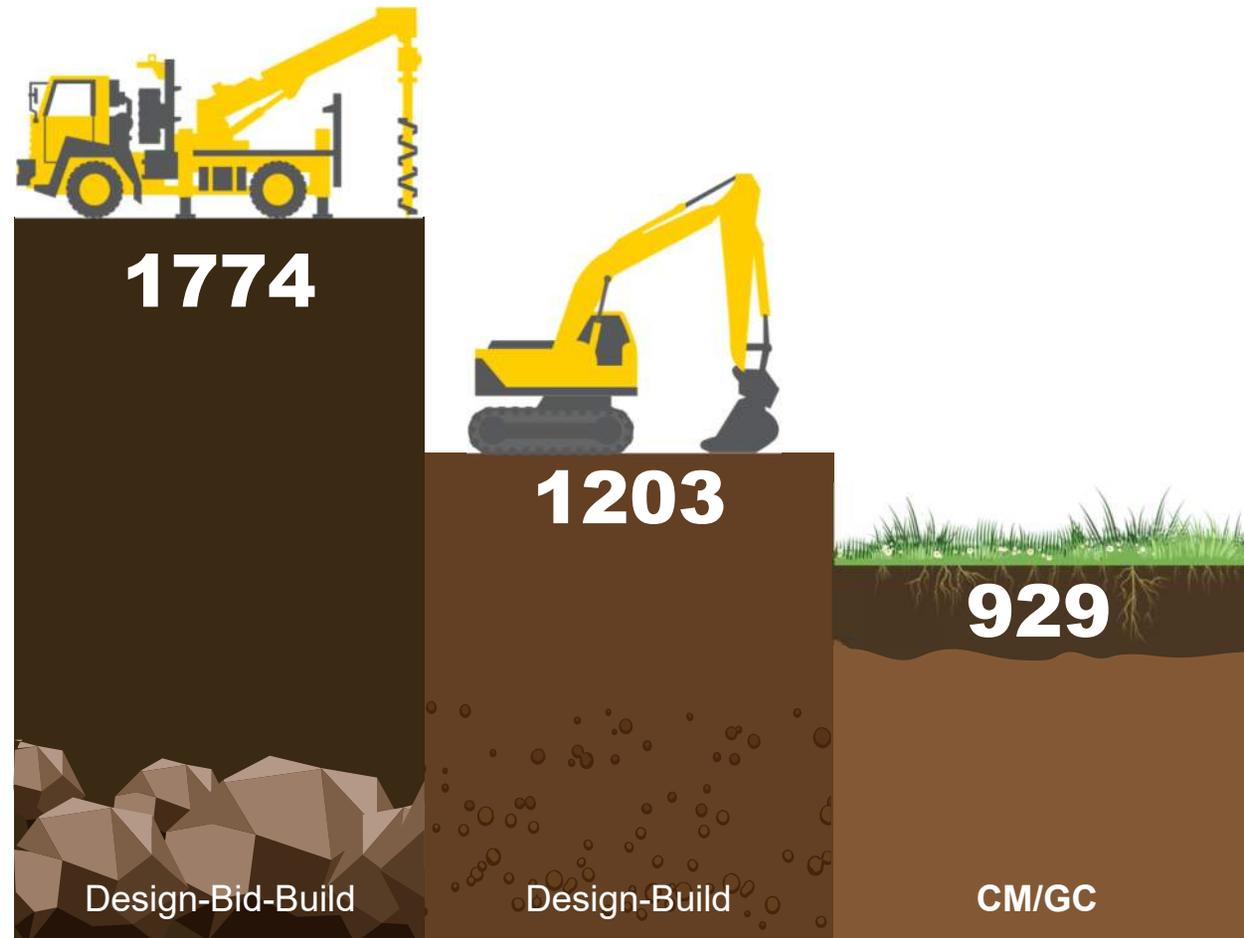
■ DBB ■ CMGC ■ DB



FHWA "Alternative Contracting Method Performance in US Highway Construction" DTFH61-13-00024. April 2018

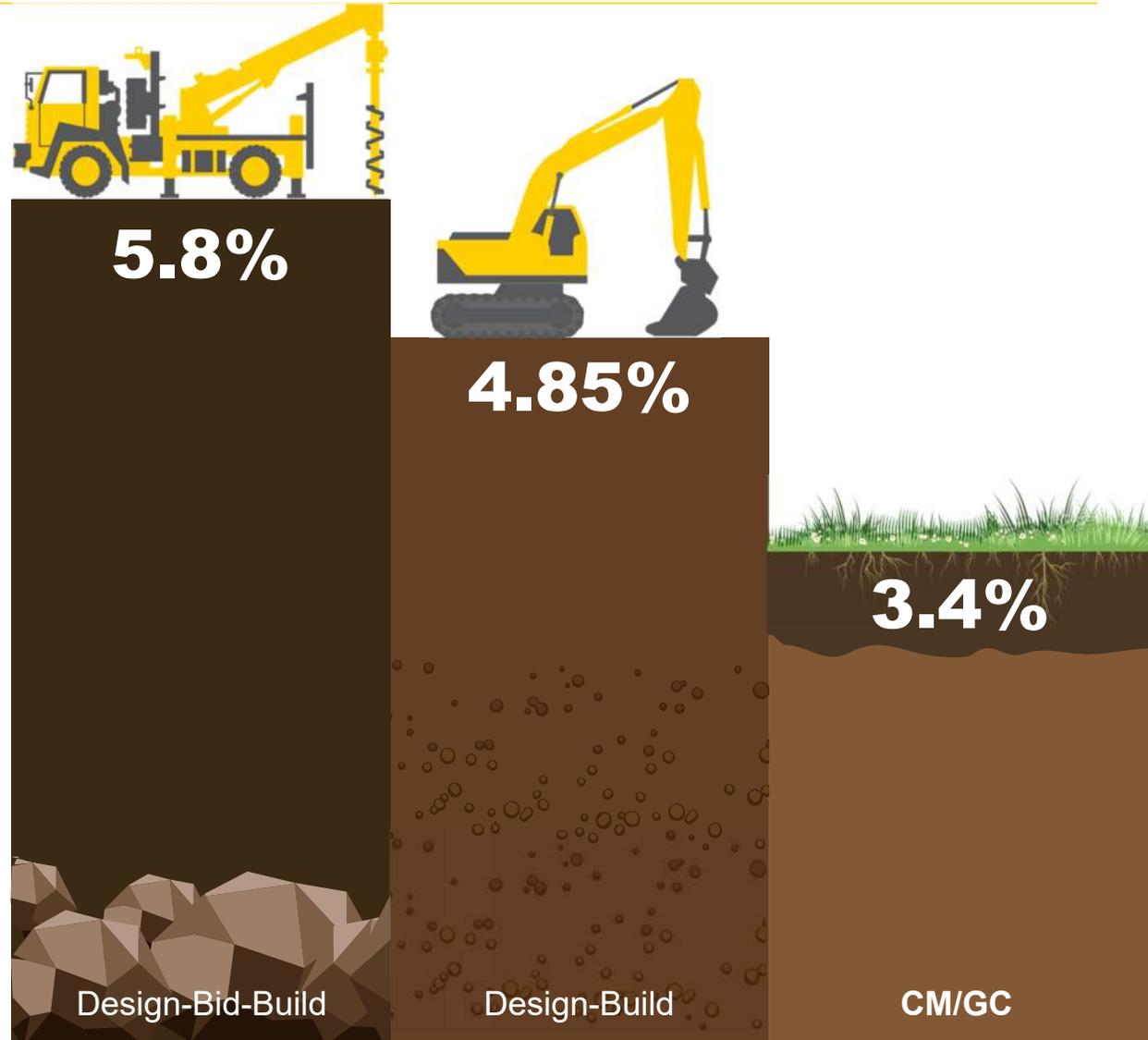
AVERAGE DURATION

- ✓ Total project length
- ✓ 32% shorter using DB
- ✓ 48% shorter using CM/GC or PDB



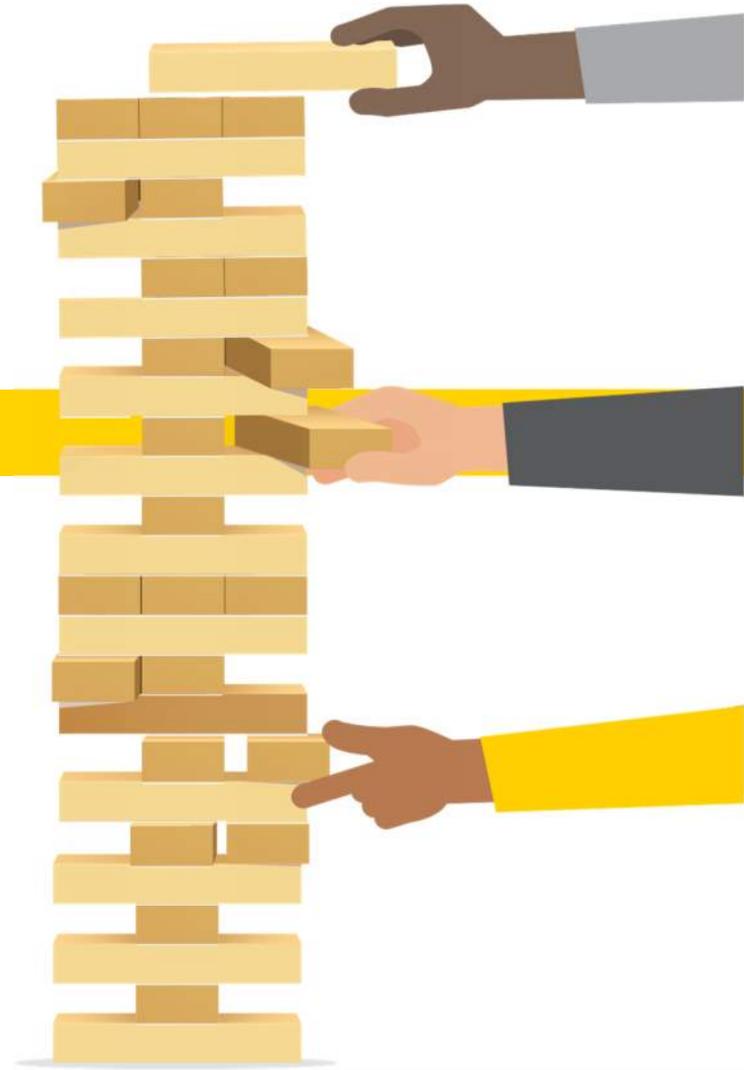
CHANGE ORDERS

- ✓ Average variation in cost
- ✓ DB – risk shifting to Contractor
- ✓ CM/GC – risk is negotiated



TOP RISKS

1. Delays associated with railroad agreements
2. Project complexity
3. Uncertainty in geotechnical investigation
4. Delays in right-of-way process
5. Unexpected utility encounters
6. Traffic control and work zone phasing
7. Challenges with obtaining environmental documents
8. Delays in delivery



DESIGN-BUILD AND THE GEOPROFESSIONAL

Robust Go/No-Go process

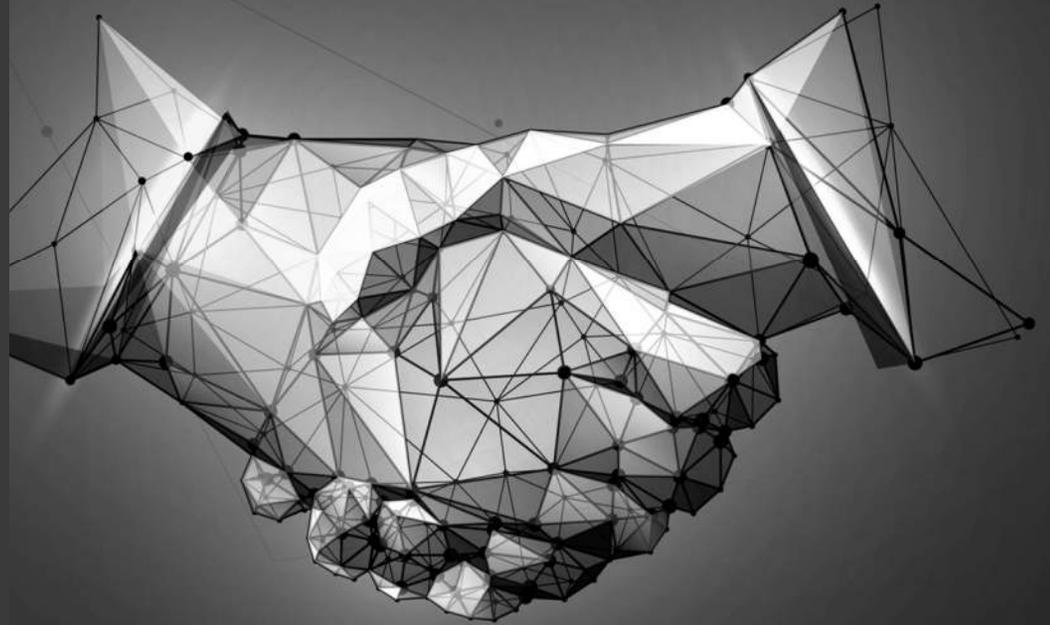
- ✓ Understand the Owner's approach
 - Risk transfer goals
 - Geotechnical Baseline Reports
 - Willingness to consider alternative technical concepts
 - How is the winning bidder selected

- ✓ Understand the Contractor's approach
 - How is the bid put together
 - Risk tolerance
 - Sub to an A/E Prime or to the contractor directly?
 - Work environment



INTEGRATED DESIGN-BUILD DELIVERY

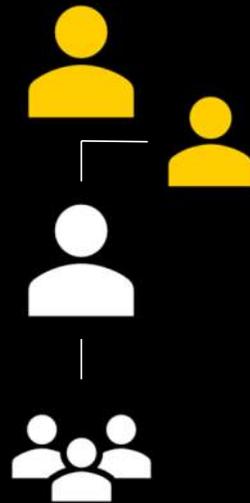
- ✓ What is it?
- ✓ Why are we doing it?
- ✓ How does it affect our partners?



INTEGRATED DELIVERY STRATEGY

"INVOLVED" VS LEAD

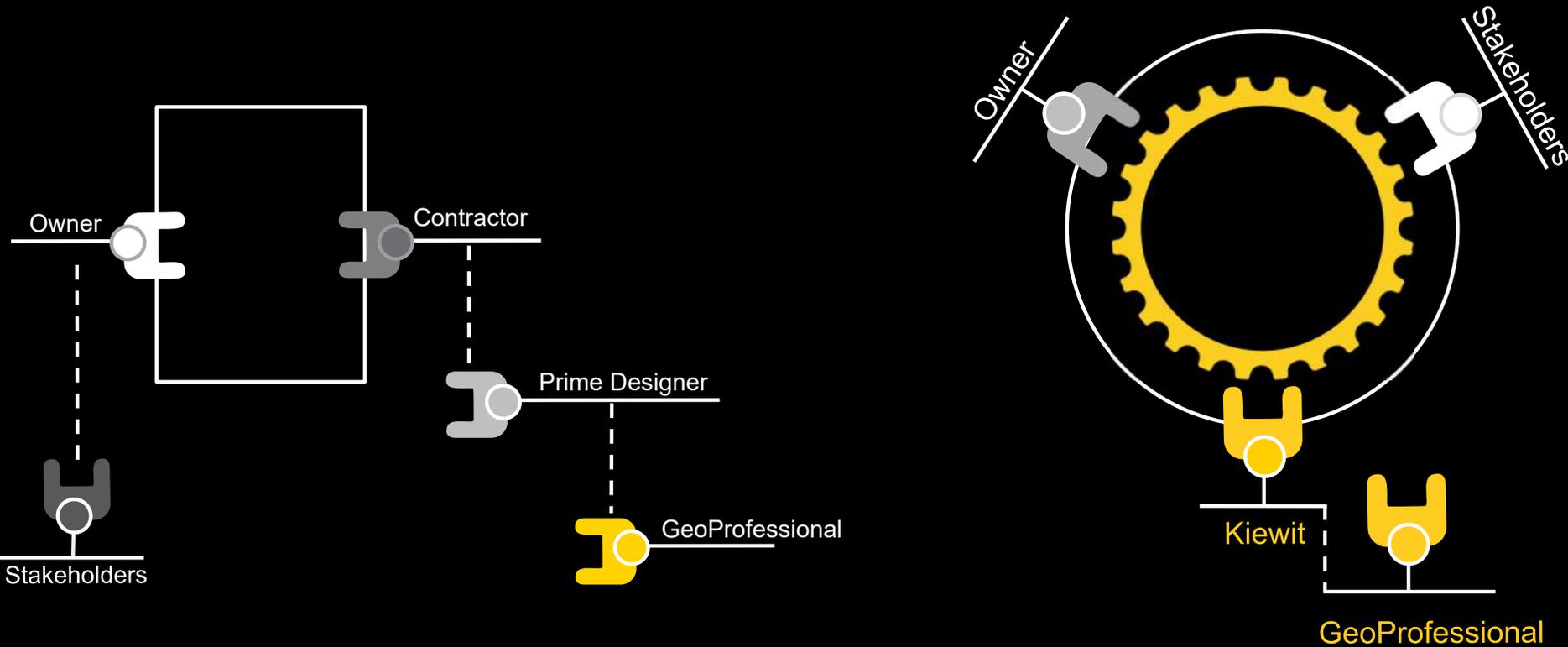
× NOT IN THE DESIGN CHAIN OF CUSTODY



✓ IN THE DESIGN CHAIN OF CUSTODY
✓ DOES NOT = SELF-PERFORM ALL DESIGN



DESIGN CONTRACT RELATIONSHIPS



GEOPROFESSIONALS WILL ALWAYS HAVE A ROLE

- ✓ Specific local experience with subsurface conditions
- ✓ Technical expertise
- ✓ Production depth
- ✓ Ability to self-perform explorations and/or laboratory testing
- ✓ Existing relationships with exploration subcontractors
- ✓ Possession of important client relationships
- ✓ Local political knowledge



REASONS FOR INTEGRATED DESIGN-BUILD STRATEGY

- ✓ Risk Reduction – Throughout all DB phases
- ✓ Fully Integrated – Design and construction team
- ✓ Design Schedule – Engineering input into schedule development
- ✓ Contractual Control – Design subconsultants contracted directly to Kiewit Engineering Group (KEG)
- ✓ GeoProfessional Lead – Lead understands risks and concerns and can assist in communicating them
- ✓ Consistent Process – Throughout Kiewit
- ✓ Best Value Superiority – KIE leads all proposal, design scope execution



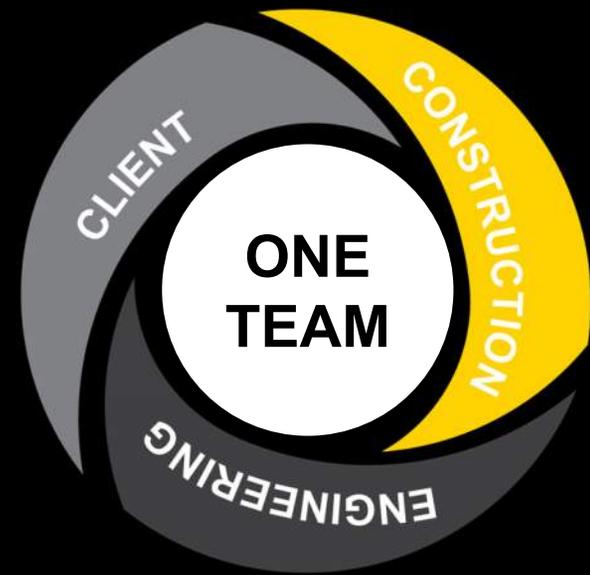
Questions

PROGRESSIVE DESIGN-BUILD:
NOT JUST AN EVOLUTION OF DESIGN-BUILD

PROGRESSIVE DELIVERY MODELS

are collaborative focused delivery methods integrating the client, engineer and contractor into one team.

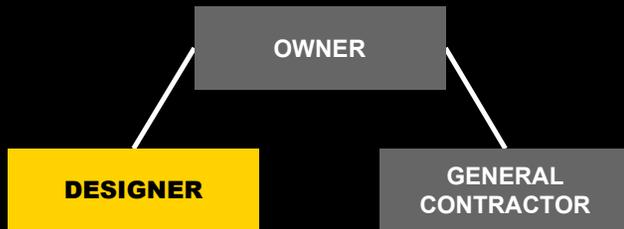
These models are the perfect solution for projects with complex design and phasing, long lead time on materials, high risk, in-depth research, multiple stakeholders, and time/budget sensitivity.



TRADITIONAL

ALTERNATIVE DELIVERY

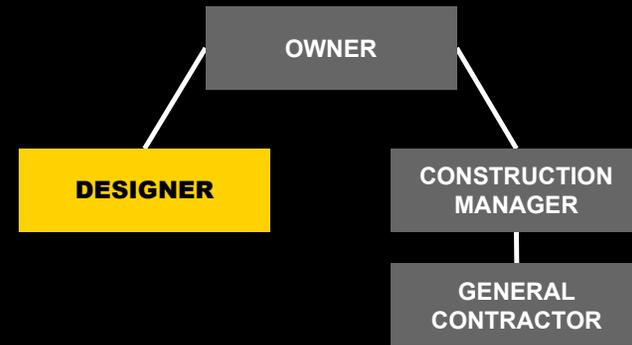
Design-Bid-Build (DBB)



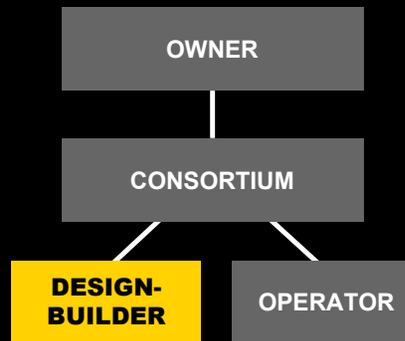
Design-Build (DB)



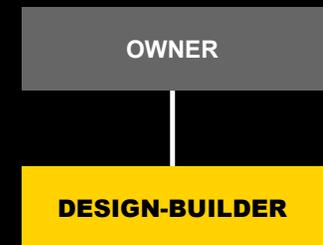
Construction Manager / General Contractor (CMGC)

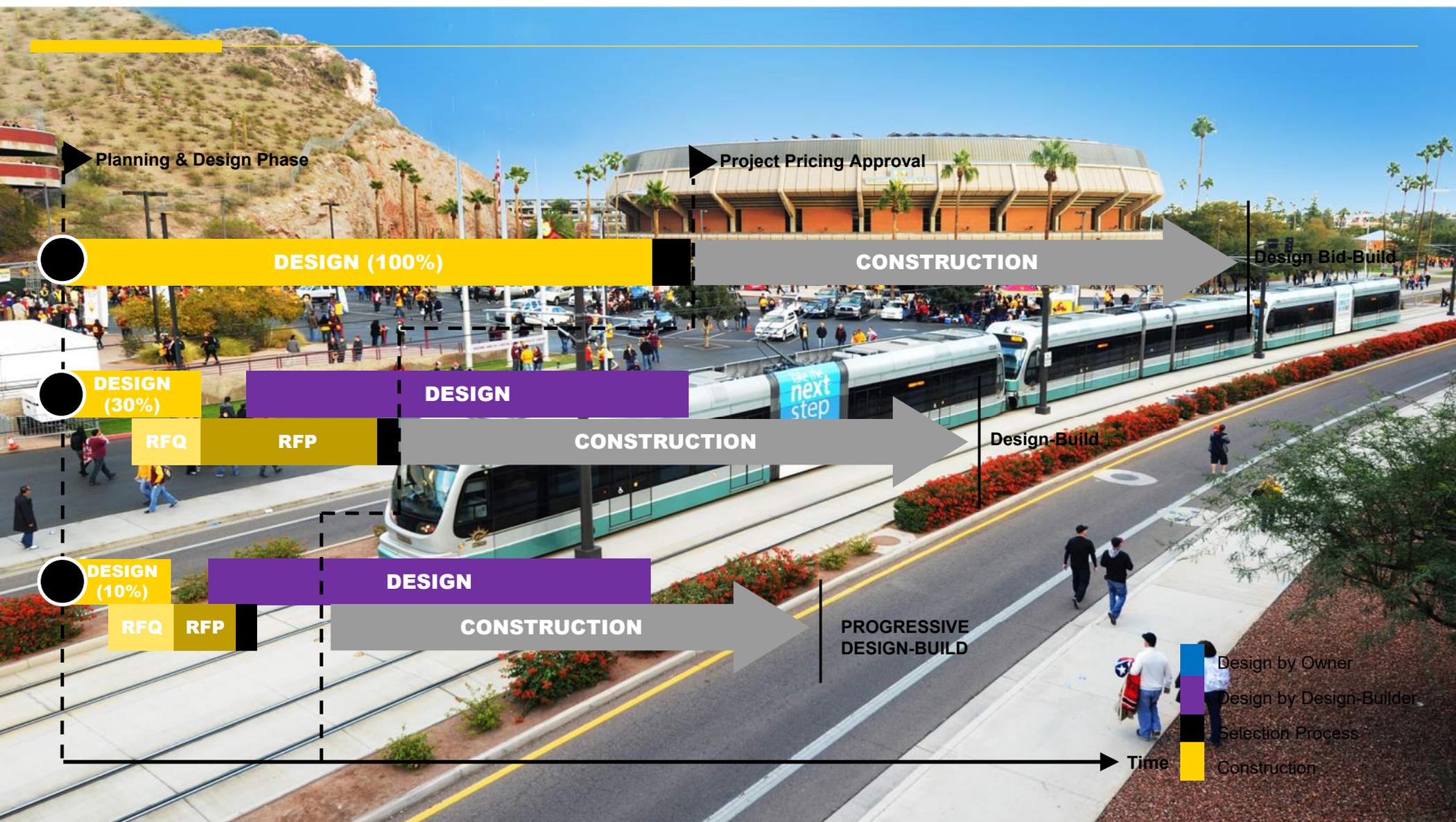


Design-Build Operate Maintain (DBOM)



Progressive Design-Build (PDB)





Planning & Design Phase

Project Pricing Approval

DESIGN (100%)

CONSTRUCTION

Design Bid-Build

DESIGN (30%)

DESIGN

CONSTRUCTION

Design-Build

RFQ

RFP

DESIGN (10%)

DESIGN

CONSTRUCTION

PROGRESSIVE DESIGN-BUILD

RFQ

RFP

Design by Owner

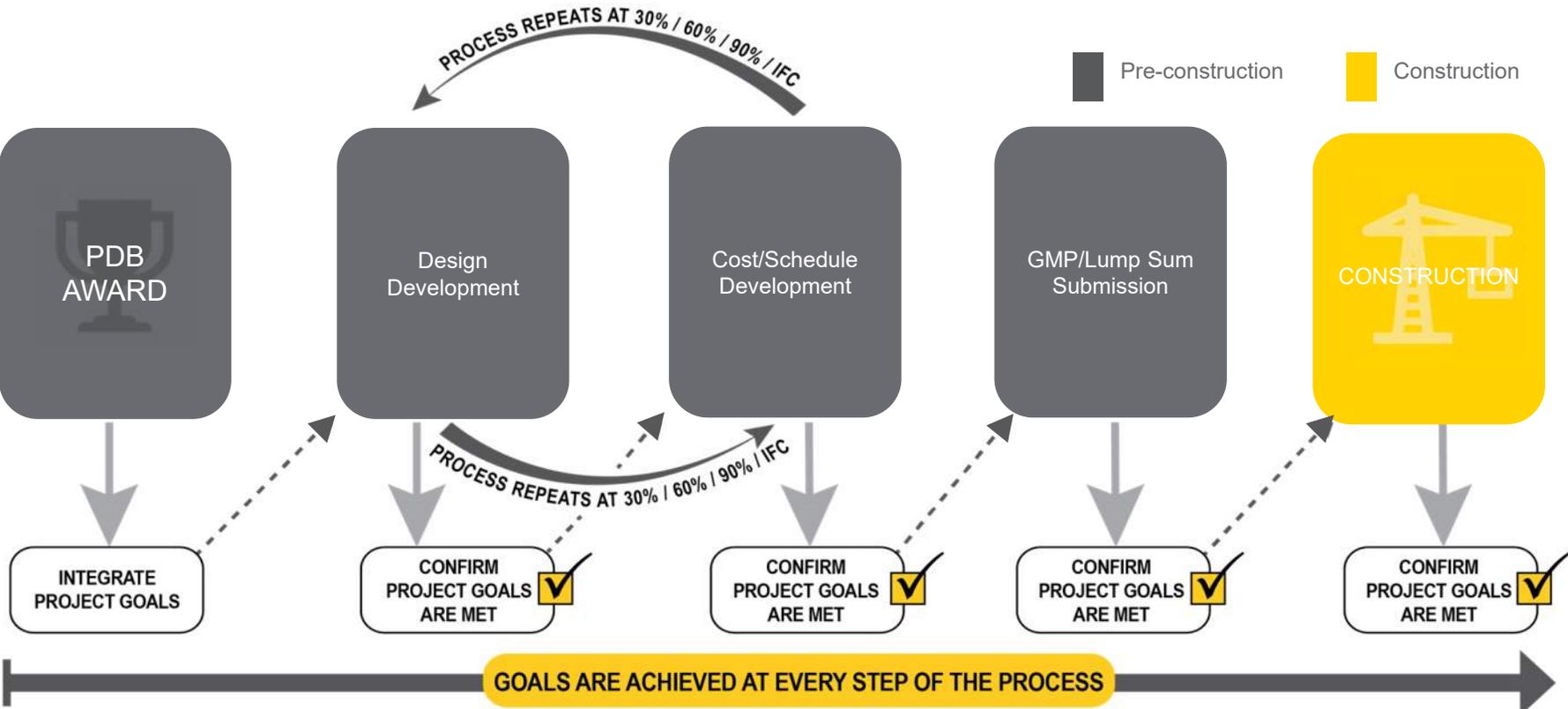
Design by Design-Builder

Selection Process

Construction

Time

PROCUREMENT AND EXECUTION



ADVANTAGES OF PROGRESSIVE DESIGN-BUILD



Collaboration and transparency that develops high performance teams



Innovation and constructability in the design that enhances Best Value Solutions



Risk Assessment & Contingency Plans that appropriately assigns risk



Opportunity to address stakeholder challenges and goals (mitigates risk)



Cost and schedule certainty



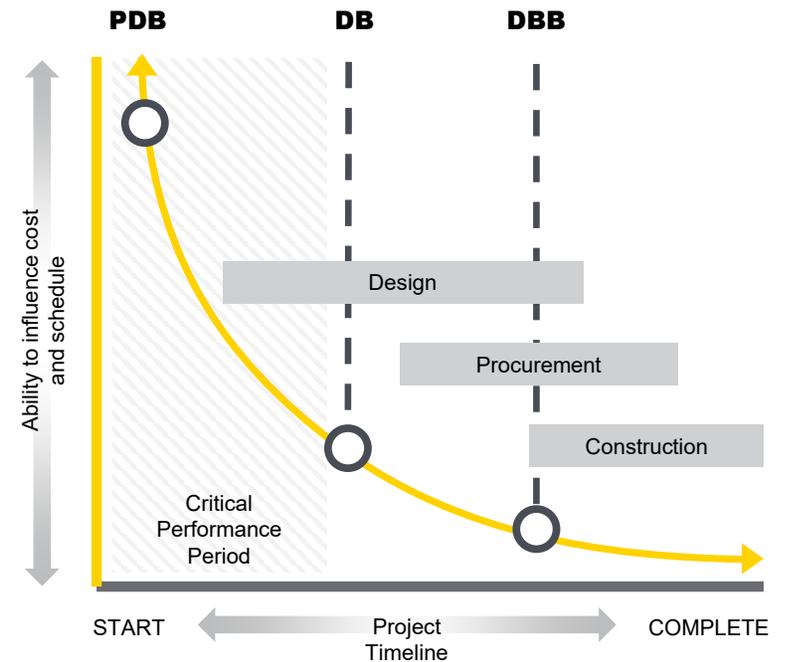
Client has off-ramps if goals are not achievable



Early planning improves ability to resource project efficiently

EARLY INVOLVEMENT MAKES A DIFFERENCE

- ✓ Maximized constructability
- ✓ Mitigation, allocation and pricing of risk
- ✓ Schedule optimization
- ✓ Early stakeholder and subcontractor engagement
- ✓ Quality, safety, compliance performance improved
- ✓ Client collaboration



DISCUSSION