

Design-Build Project Delivery for Underground Infrastructure

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Outline

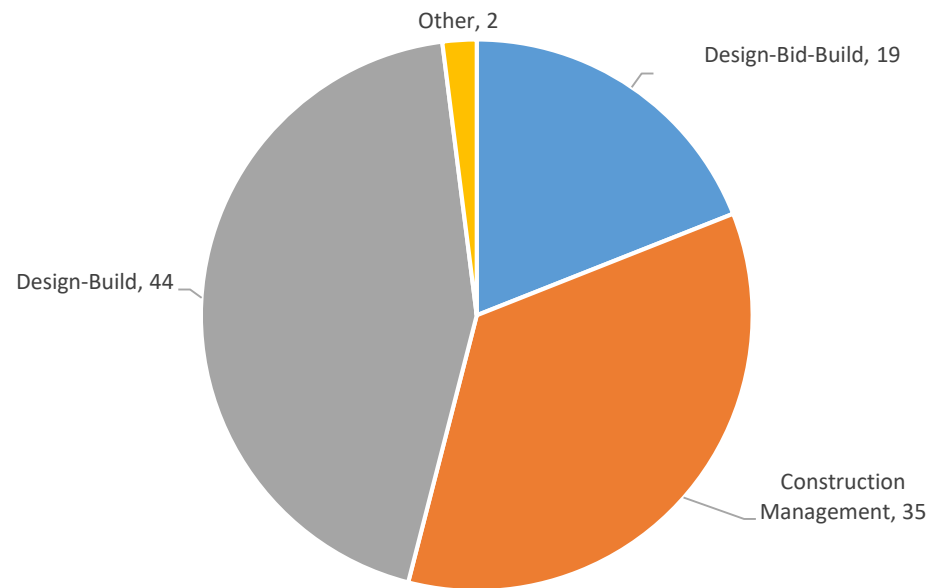
1. Design-Build Review
2. Project Background
3. Municipal Perspective
4. Procurement
5. Design and Construction
6. Preliminary Comparison to Design-Bid-Build
7. Summary

Design-Build Review

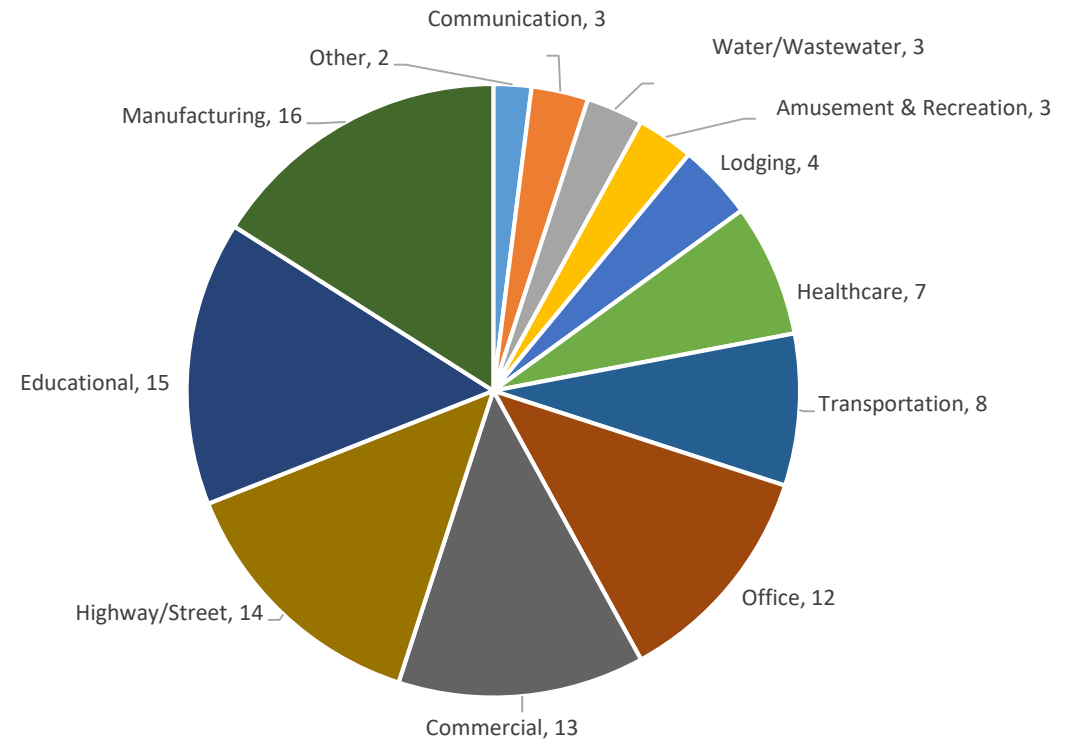
- What is Design-Build Project Delivery?
- What's new in Design-Build?
- Key Philosophies for Design-Build Services and Project Execution

Design-Build Market Share and Distribution

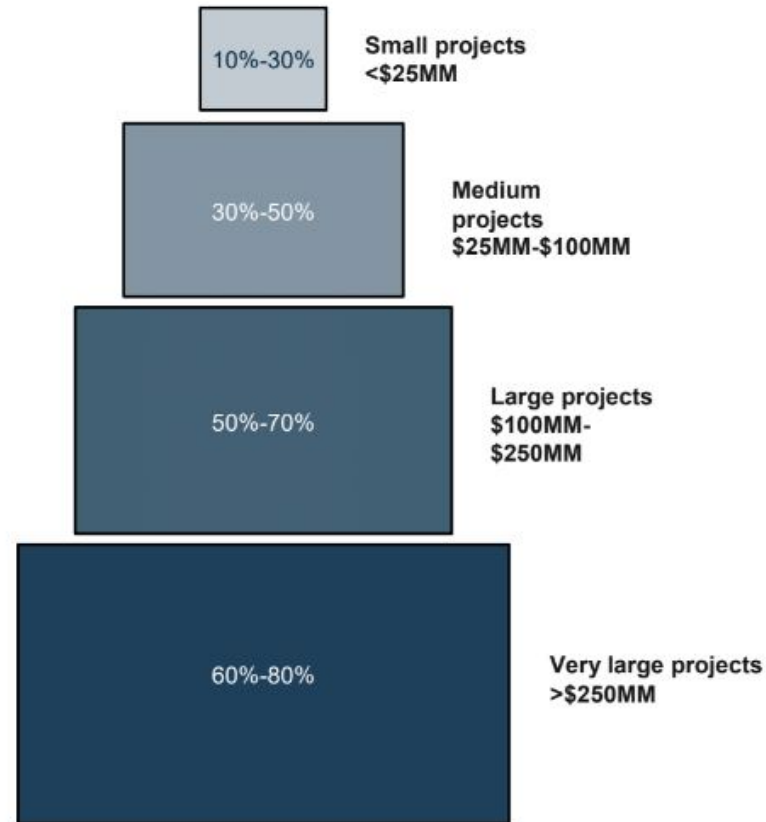
Market Distribution by Project Delivery



Spending Distribution (2018 - 2021)



Expansion of Design-Build to Smaller Projects



Cost and Schedule Performance

Performance Measure	DB vs. DBB
Unit Cost	0.3% less
Cost Growth	3.8% less
Schedule Growth	1.7% Less
Construction Speed	36% Faster
Delivery Speed	102% Faster

Fourth Street Reconstruction Project

- Project involved complete removal and replacement of all infrastructure on Fourth Street including:
 - Removal and replacement of 661m of water main, sanitary and storm piping
 - Supply and installation of 37 catch basins and manholes
 - Supply and installation of 66 water, sanitary and storm services
 - Supply and placement of new granular materials
 - Supply and placement of over 1,000 tonnes of asphalt
 - Removal and replacement of 922m of sidewalks and 1,300m of curb and gutter
 - Reinstatement of all driveways and properties

Fourth Street (2018)



Municipal Perspective

- New approach to municipal construction
- Significant planning and preparation
- Need for de-briefing sessions with proponents
- Whether stipends should be offered to proponents

Municipal Perspective - Advantages

- RFP includes technical evaluation and quality points
- Speed to completion
- Collaboration among all parties (Owner, Consultant, Design-Builder)
- Less administrative burden
- Incentive for Design-Builder to perform well

Procurement

- Procurement process involved issuing a Design-Build Request for Proposals which outlined the scope of work and referenced the MAE Municipal Master Specifications and the City of Mount Pearl specifications for new subdivisions.
- Evaluation of the RFP was based on both price and technical factors:
 1. Construction Experience (10)
 2. Design Team Experience (10)
 3. Project Management Plan (30)
 4. Safety (10)
 5. Cost of Services (40)

Design and Construction – Project Risks

- Market experience
- Unknown site conditions
- Quality control and assurance
- Financial risk

Design and Construction – Project Issues

- Issues During Design
 - Clarification of the scope following contract award
 - Sidewalk thickness
 - Manhole covers
 - Tactile plates
 - Environmental approval
- Issues During Construction
 - Encountered rock in trenching
 - Coordination with other ongoing projects
 - Condition of private services
 - Traffic control
 - Driveway tie-ins

Design and Construction – Financial Results

- The price of the preferred Design-Build Proponent was over \$500,000 below the pre-procurement estimate.
- Contract Award Value: \$3,179,451
- Estimated Total Project Cost: \$3,062,506
- Project is estimated to be complete over \$100,000 below contract due to unused allowance for rock, pole bracing and miscellaneous works
- \$4,050 per linear meter of road upgraded

Design and Construction – Schedule

- Design Duration: 56 working days
- Construction Duration: 120 working days

Preliminary Project Measures Comparison

Performance Measure	Fourth Street	Glendale/Bradley	Roosevelt
Design Duration	56 working days	110 working days	
Construction Duration	120 working days	150 working days (estimated)	
Cost per Linear Meter	\$4,050 (projected)	\$4,000 - \$4,100 (estimated)	\$4,046.98

Summary

- Successful completion of Fourth Street Upgrade using a Design-Build project delivery method
- Significant schedule improvement compared to the traditional Design-Bid-Build delivery method
- Cost analysis cannot be fully completed yet
- Resident satisfaction

Fourth Street (October, 2019)





THANK YOU

When Design-Build?

- Clearly defined project scope, outcomes and goals
- Measureable performance criteria
- Acceptance of risk, quality and cost for Design-Build process
- Project timelines
- Project complexity

Quality Assurance and Quality Control

- Quality control responsibility of Design-Builder.
- Design consultant responsible to witness all testing and sign-off on construction.
- Inspections completed by design consultant with reports provided to Owner.
- Quality assurance inspections completed on behalf of Owner regularly throughout the project.