MMM GROUP

VE and Alternate Delivery – P3 and Design Build Projects

2011 CSVA Conference

COMMUNITIES

TRANSPORTATION

BUILDINGS

INFRASTRUCTURE

Outline

- Introduction
- P3 Pursuits
  - Route 1 Gateway, NB
  - South Fraser Perimeter Road, Vancouver
- Design Build Delivery
  - CentrePort Canada Way
  - Viva Bus Rapid Transit
- SE Anthony Henday, Edmonton – P3
- Pitt River Bridge, Vancouver – DB Pursuit
- Mid Currituck Bridge, Barrier Islands NC – PDA Planning and Project Development
- Summary

Introduction

- VE has a role in Alternative Delivery
- Owners do not need to do VE in concept phase
- Leave opportunities for VE in the project pursuit
- Requires performance specifications as opposed to prescribed requirements
  - Define lane rental costs for closures
  - Outline traffic LOS guidelines for construction operations
  - Set out traffic performance levels for post construction needs
  - Leave opportunities open for road H&V geometry
  - Allow range of structure types and wall configurations
  - Clearly define rules governing design needs

Introduction

- VE has a role in delivery P3 and DB
- Value Equation

$$\text{Value} = \frac{\text{Performance}}{\text{Cost}}$$

- In the value equation, Performance is defined by the requirements of the Design Build Agreement (DBA)
- P3/DB contractors provide performance at lower cost
- Contractors and Designers are challenged with providing design and construction solutions
- Solutions must be demonstrably equal or better than those defined in the DBA

P3 Pursuits – Route 1 Gateway NB

- P3 Pursuit
- Formal facilitated VE undertaken in project pursuit
- VE addressed the following:
  - Highway alignments and profiles
  - Structure types
  - Traffic management opportunities
  - Drainage configuration
  - Pavement design
  - Management of geotechnical requirements
- Led to a successful bid for the project
- VE included Contractor, Roads, Bridges, Pavement, & Geotechnical expertise

P3 Pursuits - SFPR

- P3 Pursuit
- Formal facilitated VE undertaken
- VE addressed the following:
  - Roadway alignment, roundabouts and profiles for flood needs
  - Structure types, configurations and wall designs
  - Traffic management means and methods
  - Treatment of landfill remediation requirements
  - Pavement design and rehabilitation performance modeling
  - Assessment of seismic requirements and poor soil conditions
- Led to full knowledge of project risks
- VE included Contractor, Roads, Bridges, Pavement, & Geotechnical expertise

Design Build – CentrePort Canada Way

- Design Build fast track project for stimulus work
- No time for VE in concept development
- Some opportunity for VE in pursuit process but client wanted prescriptive specifications
- RFP responders addressed:
  - Road configurations
  - Wall design options
  - Geotechnical solutions
  - Structural options
  - Utility needs
- Alternative concepts accepted in submissions

Design Build – Viva Bus Rapid Transit

- Unique project needs
  - Aesthetics is a key issue
  - Confined work space
  - Maintenance of traffic
  - Innovation in streetscape and traffic management
  - Pedestrian circulation

- Design Build project by an Alliance Contract model
- Preliminary design, costing & DB delivery by selected Proponent
- Opportunities exist for VE in DB process, however:
  - No formal VE proposals
  - Opportunities exist for VE win-win scenarios in design development
  - Share of savings offered between Owner and DB Contractor

SE Anthony Henday, Edmonton – P3

- P3 Project Pursuit and delivery
- Formal VE undertaken during pursuit
  - Materials supply and quality
  - Structure span options and abutment configurations
  - Retaining wall design, wick drain & maintenance considerations
  - Interchange design departures from AT practises
- Project delivery offered significant innovation
  - 91 street interchange layout
  - Utility relocation cost avoidance
  - Electrical design standards
  - Environmental management of SWM ponds and compensation
  - Bridge geometry

Pitt River Bridge, Vancouver – DB Pursuit

- Maryhill Interchange on approach to bridge
- Major River Crossing
- DB process delivered significant innovation in interchange layout

- Traffic management approach was significant contribution to success
- Substructure design a major contributor to reduced costs
- No formal VE process

Mid Currituck Bridge, NC – PDA

- PDA Project in Barrier Islands North Carolina
- Developer input into the environmental process (NEPA)
  - Input and influenced interchange layout
  - Toll configurations integrated into design concepts
  - Provided ideas with respect to Maple Swamp crossing
  - Bridge foundations, a major cost, was optimized
  - Bridge cross sections evaluated
  - Deletions of work on island for NC12
- FHWA VE process mandated
  - Project constraints limited additional savings
  - Largely revisited previous options
  - ROD constrained opportunities

Summary

- VE is a significant tool in Alternative Delivery
- Process drives innovation
- Necessity really is the mother of invention
- Many pursuits use VE at outset of RFP response
  - Information phase gets all up to speed
  - Kick off opportunity and team building
  - Opportunity for interdisciplinary interaction
  - Creative interaction between contractor and designers
- Limited use of formal VE in project delivery
  - Need to explore opportunities to expand use
  - Designers are too busy to get going to plan
  - Need to take a deep breath, use VE then execute

Thank you