Changing Project Delivery Strategy:

An Implementation Framework

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Agenda

- **Introduction**
- **Implementation Framework**
- **Framework Validation**
- **Conclusions**

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Project Delivery Strategy

"The set of project delivery methods that the Owner may adopt for delivering its projects."

How Are DOTs Delivering Projects?

- **Traditional project delivery**
  - Design-Bid-Build

- **Use of alternative methods**
  - Design-build
  - Warranties/Maintenance

- **Innovative financing**
  - Private financing

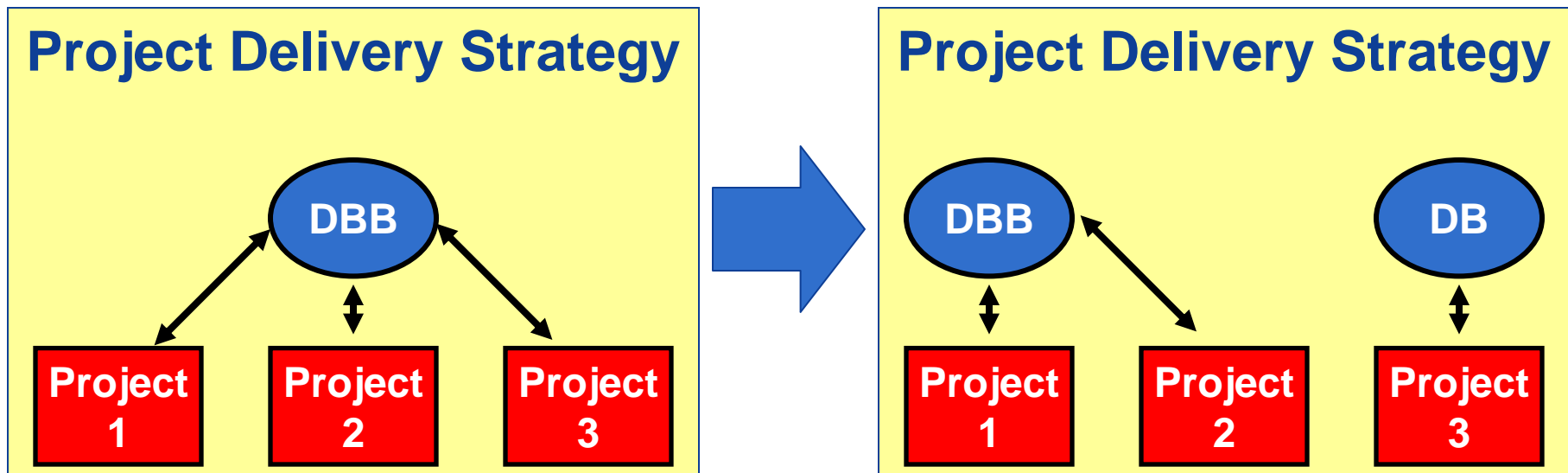SCDOT: Bridge on Cooper River
Design-Build Delivery Method

Courtesy: http://www.dnr.sc.gov

TXDOT: Trans Texas Corridor
Public-Private-Partnership

Courtesy: www.dot.state.tx.us

Change to Project Delivery Strategy

Affect a broadening or a narrowing of options

Delivery System Change: Challenges for the Transportation Sector

- Cultural barriers (Molenaar and Gransberg 2001)

  - *"As agencies attempt design-build for the first time, they are constrained by the […] culture in their organizations"*

- Lack of experience (FHWA 2004)

  - Increase in staff time

  - Potential loss of traditional safeguards

- Approaches for implementing change

  - Initiation of "pilot" projects

  - Development of "programmatic" initiatives

Exploratory Study - Overview:
State Highway 130 Project (1/3)

- **Five new toll-roads**
- **SH 130**
  - 49 miles
  - 119 bridges
  - 4 major interchanges
  - $ 1.4 billion DB contract
  - 5 years delivery
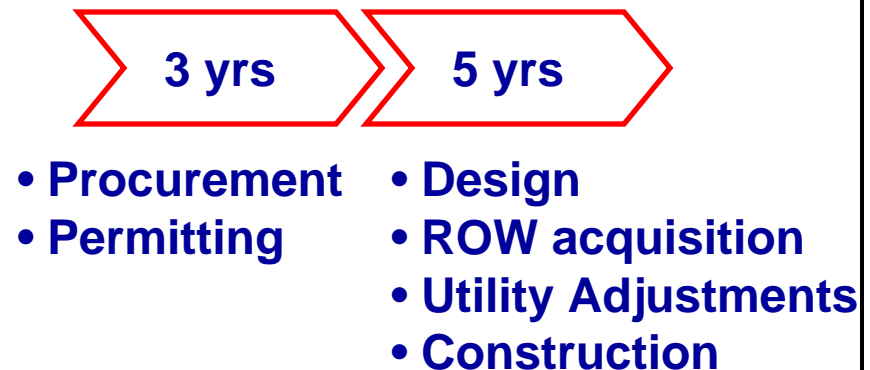 - First two segment completed 10 months earlier than contract

Austin, TX

D-B
Sept 02

Courtesy: www.texastolls.com

Exploratory Study - Overview:
State Highway 130 Project (2/3)

SH-130: DBB Delivery

12-15 years

SH-130: DB Delivery

3 yrs   **5 yrs**

- Procurement
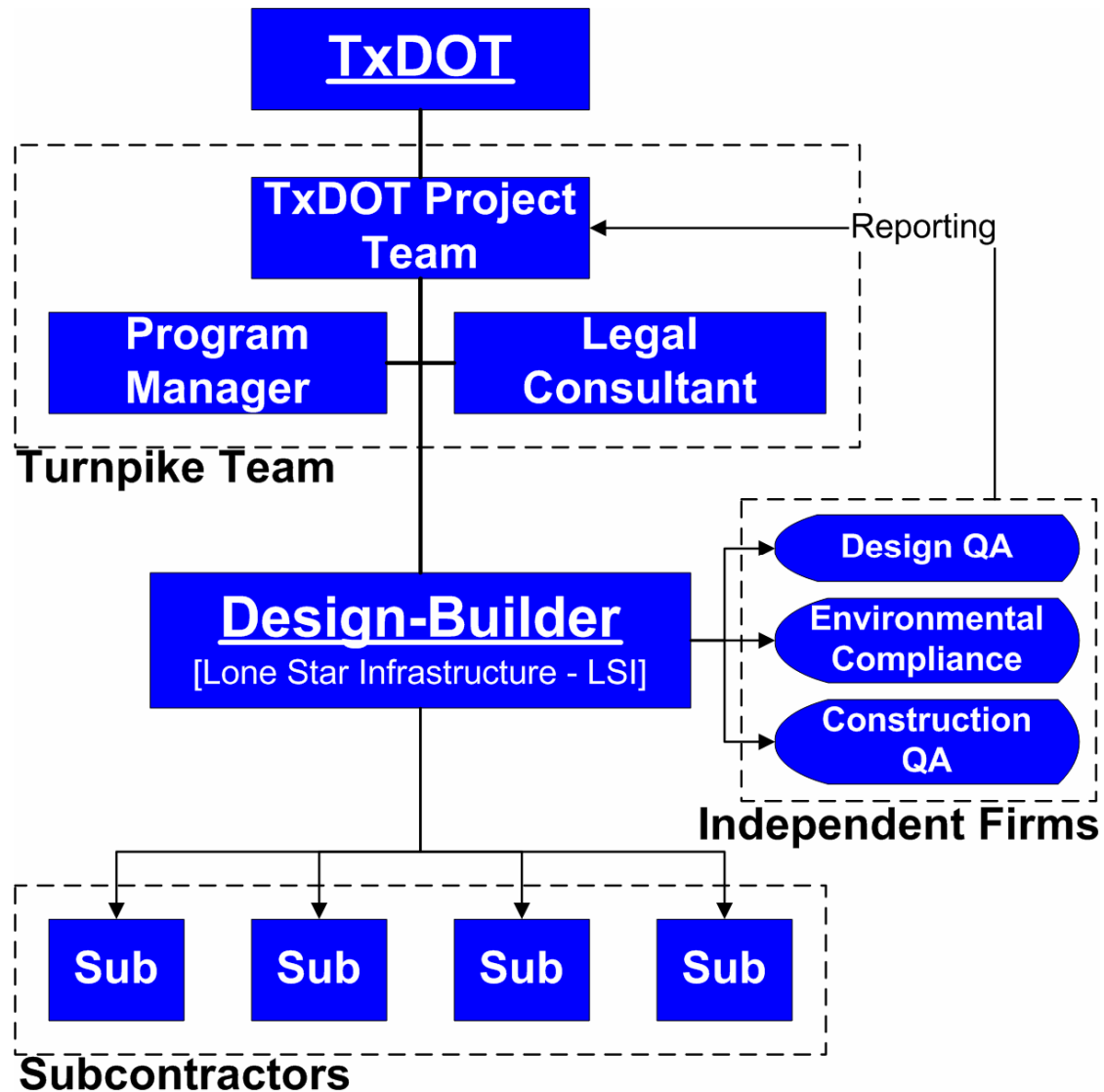- Permitting

- Design
- ROW acquisition
- Utility Adjustments
- Construction

■ Challenges:
- ○ Largest contract awarded by TXDOT
- ○ Cultural shift
- ○ Procurement, legislative action and permitting
- ○ Outsourcing to engineering consultant
- ○ Aggressive allocation of risks to design-builder

Exploratory Study - Overview:
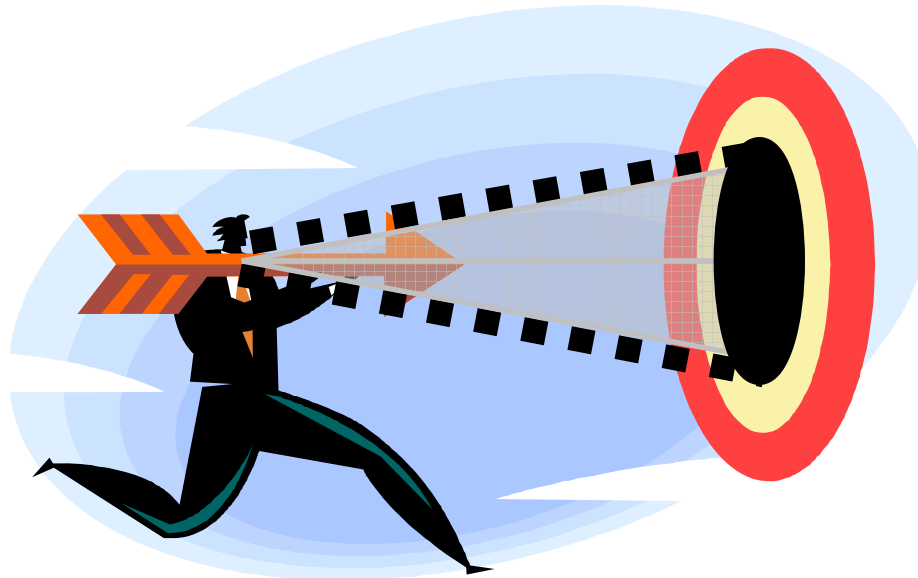## State Highway 130 Project (3/3)

Research Objectives

- Understand change in project delivery strategy

- Provide a framework for implementing change

Scope Limitations

- Focus on the highway project sector

- Focus on change of delivery strategy

- Observe change resulting from adopting DB

Research Methodology (1/2)

- **Exploratory Study**
  - Data Collection
    - Attendance at TXDOT events
    - Project documentation and newsletters
    - Qualitative research approach
      - Semi-structured interview process
      - Interview transcripts
  - Data Analysis
    - Coding of interview transcripts
      - Open, axial and selective coding
      - Template analysis

Research Methodology (2/2)

- **Delphi study**
  - Data Collection
    - Quantitative data $\rightarrow$ Ratings
    - Qualitative data $\rightarrow$ Comments
  - Data Analysis
    - Quantitative data
      - Descriptive statistics
      - Inter-rater reliability
    - Qualitative data
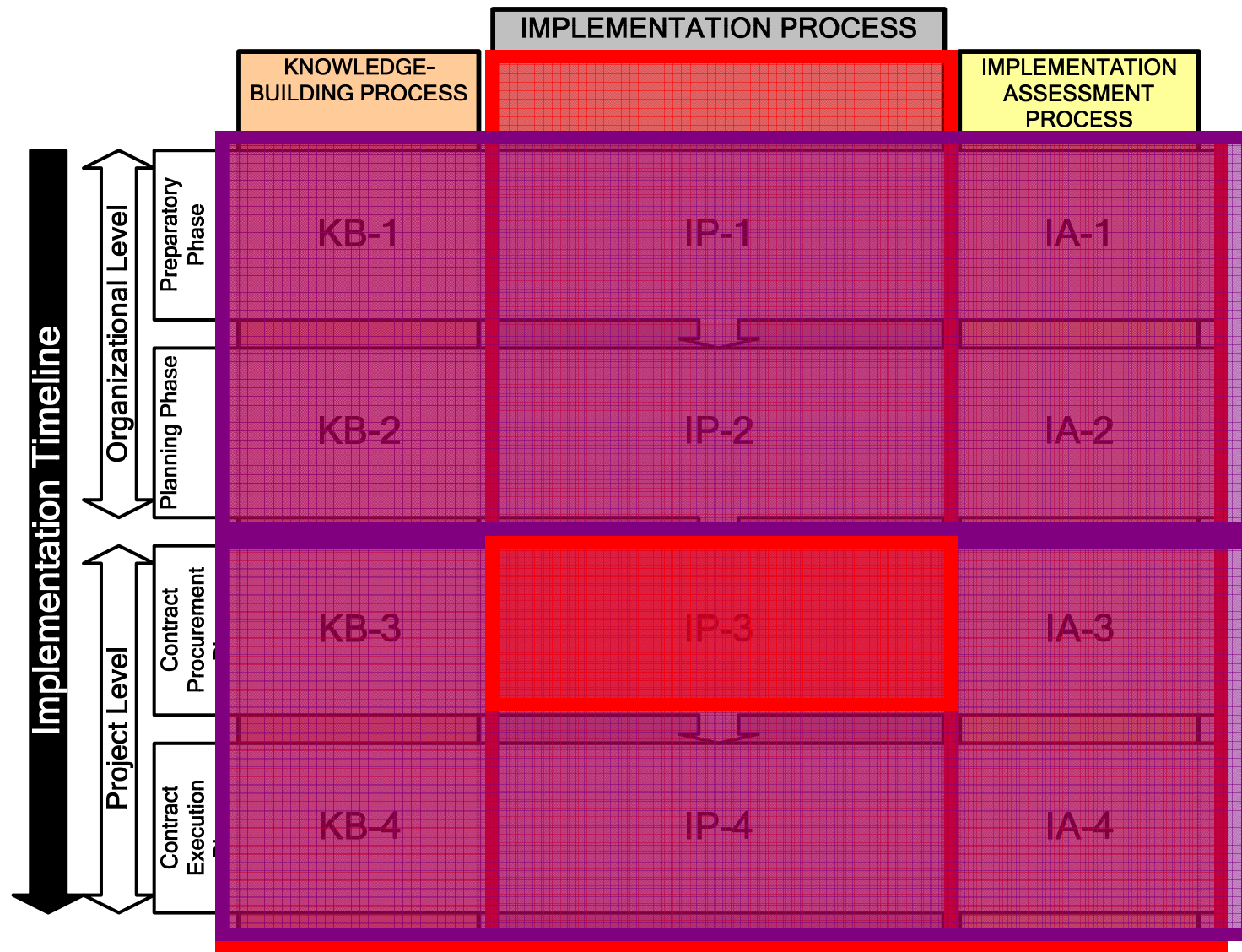   - Template analysis

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Framework Formulation:
Strategic Management Perspective

- Bridging strategy formulation & implementation
- Based on predominant perspective of the strategy process (Mintzberg 1987)
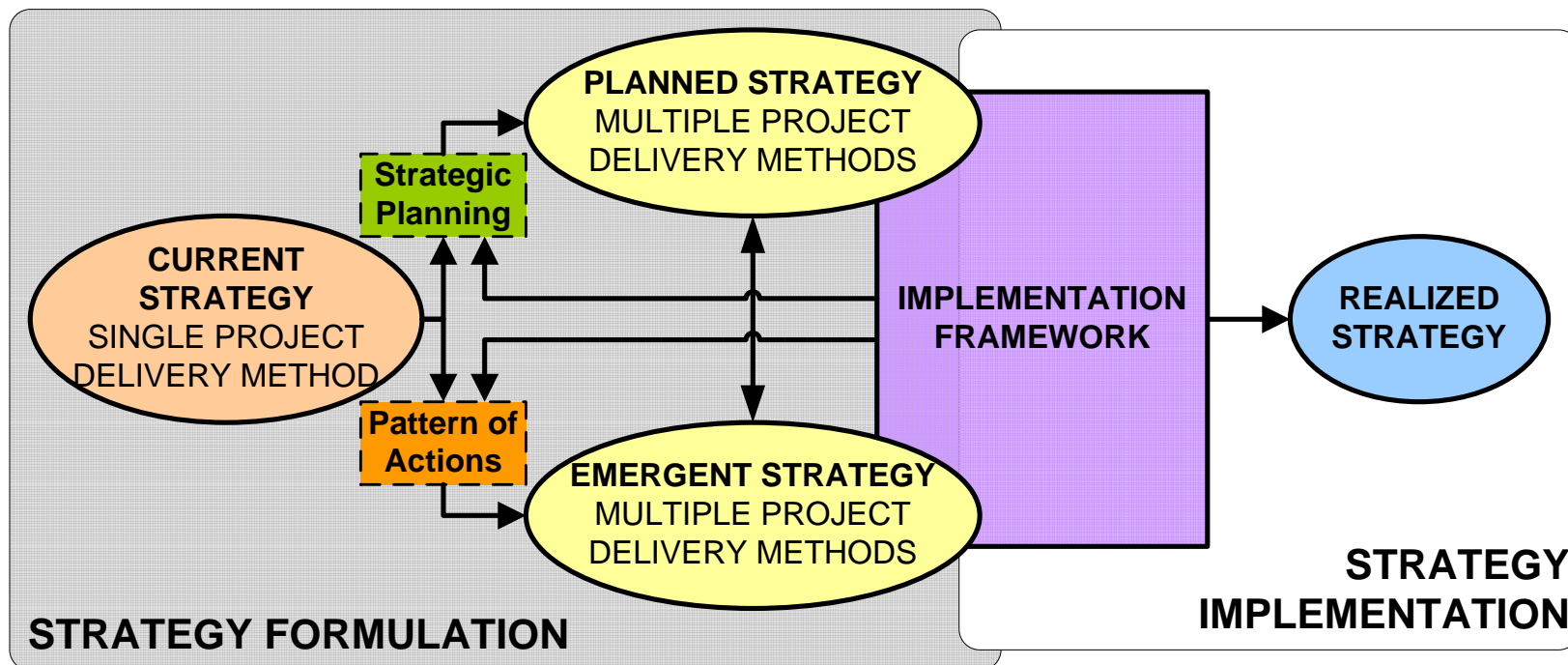
Changing Delivery System (CDS) Framework Components

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Cases

- **Additional projects**
  - SH 45 SE, Austin, TX, $154MM
  - T-Rex, Denver, CO, $1.6 B
  - I-405 corridor, Seattle, WA, $48 MM
  - I-5 HOV, Seattle, WA, $185 MM
- **Findings**
  - Confirmed SH130 findings
  - Insight into framework
  - Modified terminology

Delphi Study – Panel Selection

- Criteria for identifying industry experts
  - Participation on industry committees and taskforces for innovative project delivery (TRB, DBIA, AASHTO)
  - Publications on innovative project delivery
- Invited 90 experts
- Questionnaire sent to 35 experts
- Submitted 26 questionnaires
  - 75% response rate

Delphi Q1 – Respondents

- Panel Expertise
  - Average industry experience
    - 22 years
  - Average total value of projects managed
    - $2.2 billion
  - Role of affiliated organization
    - 14 owners, 2 design-builders, 6 consultants, 4 academics
  - Areas of expertise of panelists
    - Panel's overall expertise: 18 different disciplines
  - Experience with delivery methods
    - Panel's overall experience: 8 different methods
    - Individuals' experience: Varying amounts of direct experience with both DB and DBB

Delphi Q1 – Framework Components

Item	Mean	IRR
Implementation process	5.9	0.85
Knowledge-building process	5.9	0.91
Implementation assessment process	6.0	0.92
Preparatory phase	6.0	0.85
Planning phase	6.0	0.92
Design-Build procurement phase	6.2	0.88
Design-Build administration phase	6.1	0.85

Rating provided on a 7-point scale
1 = Strong Disagreement
7 = Strong Agreement

Delphi Q1 – Analysis of Panel Feedback

- Approximately 1,100 comments analyzed with a qualitative research technique
  - *Template analysis* (King 1998)
- Twenty-five themes
  - Success factors
  - Barriers to implementation
  - Implementation activities
- Three levels
  - Agency Environment (6 themes)
  - Agency Organization (9 themes)
  - Project (10 themes)

Example: Delphi Q1 – Environment Level Success Factors

Legislative authority for changing agency's delivery and finance strategy (External): Legislative authority is obtained by a change in the legislative framework allowing changes to the agency's project delivery and finance strategy. A transportation agency needs legislative authority before instituting changes to its procurement and finance strategy. Changes to the regulatory framework occur at different levels (federal/state), and affect different aspects including:

    a)   allowed degree of project services that can be outsourced; and

    b)   allowed project delivery methods.

An absence of legislative authority constitutes a barrier to change. Suggestions for overcoming this barrier include:

    (1) work with and educate industry providers and elected officials;

    (2) inform general public;

    (3) advocate for legislative authority; and

    (4) draft legislation.

Delphi Q2 – Environment Level Success Factors

Item	Mean	IRR
Change to the agency's delivery and finance strategy is driven by clear needs	6.1	0.71
Legislative authority	6.5	0.71
Support by elected officials	5.5	0.51
Support/acceptance by industry providers	5.4	0.76
Acceptance by other relevant parties	4.1	0.60
Acceptance by general public	3.8	0.68
Rating provided on a 7-point scale 1 = Not Important; 4= Important; 7 = Extremely Important		

Delphi Q2 – Organization Level Success Factors

Item	Mean	IRR
Management vision and support for change	**6.4**	**0.74**
Organization implementation plan	**5.6**	**0.59**
Method for selecting delivery methods	**5.4**	**0.69**
Acceptance of change by agency staff	5.3	0.64
Redesigned staffing procedures	5.3	0.74
Availability of agency staff	5.1	0.67
Communication with external parties	5.0	0.70
Knowledge of newly introduced approaches	4.9	0.45
Assessment of the change's outcome	4.8	0.73
Rating provided on a 7-point scale 1 = Not Important; 4= Important; 7 = Extremely Important		

Delphi Q2 – Project Level Success Factors

Item	Mean	IRR
Clear and fair approach to managing project risks	**6.0**	**0.78**
Quality of contractual documentation	**6.0**	**0.65**
Acceptance by project parties	**5.8**	**0.76**
Competitive participation of qualified providers	**5.6**	**0.74**
Contract administration procedures facilitating new approach	5.5	0.68
Procurement process efficiency	5.5	0.73
Owner project team staffing level	5.3	0.74
Comprehensive implementation plan at the project level	5.2	0.56
Project's organizational structure facilitating new approach	5.1	0.72
Project's communications facilitating new approach	5.1	0.78

1 = Not Important; 4= Important; 7 = Extremely Important

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Summary

- **Change is difficult**
  - Internal
  - External
  - Human resources

- **Implementation framework is valid**
  - Knowledge building
  - Implementation
  - Implementation assessment

Conclusions (1)

- Agency's delivery and finance strategy must be driven by a clear need to change

- Management vision and support must be behind the effort

- Elected officials need to be supportive

- Support and acceptance by industry providers

Conclusions (2)

- Comprehensive legislative authority must be gained

- Organizational implementation plans to facilitate the change should be developed and used

- Method matching projects with delivery methods should be in place

- Clear and transparent approach to managing project risks should be developed

Conclusions (3)

- Quality of contractual documentation should match delivery method and project risks

- Acceptance by project parties, both internally and externally

- Contract administration procedures for facilitating

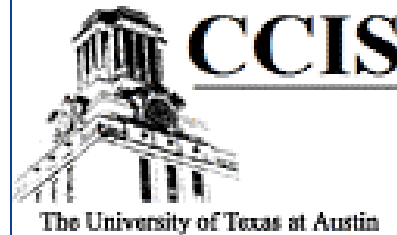- Competitive participation should be encouraged

Acknowledgments

Exploratory Study

- **Phillip Russell, TXDOT**
  - Texas Turnpike Authority Director
- **Tim Weight, TXDOT**
  - CTTS Project Director
- **Jeff Curren, HDR**
  - SH-130 Program Manager
- **Robert Stuard**
  - Deputy District Engineer Austin
- **27 project participants**

Framework Validation

- **Matthew McDole, E-470**
  - Chairman of DBIA Owner Council
- **Gerald Yakowenko, FHWA**
  - Leader FHWA Contract Administration Group
- **Delphi panel: 26 experts**
- **Case studies interviewees**