# Agenda

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<th>Time</th>
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<tbody>
<tr>
<td>8:00-8:30</td>
<td>Registration</td>
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<tr>
<td>8:30-8:45</td>
<td>Welcome</td>
<td>Jon Epps – TTI</td>
</tr>
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<td>History of Accelerated Construction</td>
<td>David Newcomb – TTI</td>
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<td>TxDOT’s Interest</td>
<td>Randy Hopmann – TxDOT, ADM</td>
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<td>9:30-9:50</td>
<td>Project Selection Economics</td>
<td>Brianne Glover – TTI</td>
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<td>9:50-10:10</td>
<td>Break</td>
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<td>10:10-10:40</td>
<td>Project Development</td>
<td>Michael Bostic – TxDOT, CST</td>
</tr>
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<td>10:40-11:00</td>
<td>Accelerated Bridge Construction</td>
<td>Steven Austin – TxDOT, BRG</td>
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<td></td>
<td>Dan Richardson, TxDOT, ABL</td>
</tr>
<tr>
<td>11:00-11:20</td>
<td>Design Considerations</td>
<td>Chris Graf – TxDOT, BWD</td>
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<td>Traffic/Safety</td>
<td>Paul Norman – TxDOT, ABL</td>
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<td>11:30-11:40</td>
<td>Public Information</td>
<td>Karen Threlkeld – TxDOT, CMD (SJT)</td>
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<tr>
<td>11:40-12:00</td>
<td>Construction</td>
<td>Kenneth Ford – Jones Brothers Dirt and Paving Construction, Inc.</td>
</tr>
<tr>
<td>12:00-12:45</td>
<td>Lunch</td>
<td>David Newcomb – TTI</td>
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### Breakout Groups

- A-Pavement Strengthening
- B-Pavement Widening
- C-Rural Intersection Reconstruction
- D-Bridge Widening
- E-Small Town Main Street
- F-Suburban/Rural Road Widening

### Moderators:

- A-Ryan Sales – TxDOT, ABL
- B-John Speed – TxDOT, ODA
- C-Bart Fris – TxDOT, BWD
- D-Mike Beaver – TxDOT, WFS
- E-Stuart Withington – TxDOT, SJT
- F-Marshall Heap – TxDOT, SJT

### Recorders:

- A-Gary Enos – TxDOT, SJT
- B-Allan Moore – TxDOT, WFS
- C-Will McLane – TxDOT, SJT
- D-Kristi Harwell – TxDOT, ABL
- E-Dan Hohmann – TxDOT, BWD
- F-Fred Herrera – TxDOT, ODA

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<td>Summary/Adjourn</td>
<td>Jon Epps – TTI</td>
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District Workshops on Accelerated Construction
Welcome
AC-PP-17-01
Jon Epps

Abilene
MCM Elegante Suites
November 7, 2017

www.txdot.gov/business/resources/construction/regional-workshops.html
Interest in Accelerated Construction

• Visibility to public
• Safety
• Economics
Accelerated Construction

• Welcome
• Definition
• Overview of day
• Overview of topics
• Overview of goals
• Introductions

Definition of Construction

Greenfield

• Capacity improvement
• Reconstruction
• Rehabilitation
• Major maintenance
• Minor maintenance
## Project Delivery

<table>
<thead>
<tr>
<th>Planning &amp; Programming</th>
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<td>• ROW map</td>
<td>• Final alignment &amp; profiles</td>
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<td>• Documentation</td>
<td>• Appraisals</td>
<td>• Roadway</td>
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<td>• Utility adjustment</td>
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### Time

- Letting
- Construction
Acceleration Goals

**Good**

Construction time

20 to 0 %

**Better**

Construction time

50 to 20 %

reduction *in time* to complete project
CAUTION

Not All Projects Are Suitable for Accelerated Construction
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ACCELERATED CONSTRUCTION DOCUMENTS

• Briefs
• Implementation Reports
• Presentations

District Workshops on Accelerated Construction
Welcome
AC-PP-17-01
Jon Epps

Abilene
MCM Elegante Suites
November 7, 2017
www.txdot.gov/business/resources/construction/regional-workshops.html

ACCELERATED CONSTRUCTION BRIEF
Construction Division

AC-B-17-04 ACCELERATED CONSTRUCTION GUIDELINES

BACKGROUND
The cost of delays during construction are disproportionately high compared to delays associated with other elements of the delivery process. Traffic delays due to construction can be extremely costly as high traffic projects can also impose costs on users, and can also be significant and should be considered in economic impact analyses.

The combination of these economic impacts directly by the public agency and society, and to the construction zone as the facility and perhaps the entire highway system, requires a more direct approach to new approaches to develop new projects and implement the final product of accelerated construction. A tool that is available to help develop the entire project is to develop accelerant pricing for the project, which can be used to work better with contractors and agencies.

MATERIALS AND SELECTION

ACCELERATED CONSTRUCTION GUIDELINES

Project Level Economic Screening Tool

by
Brianne A. Glover, J.D.
David R. Ellis, Ph.D.

Texas Department of Transportation
Texas A&M Transportation Institute
Workshop Goals

• Information sharing

• Existing TxDOT “tools”

• Identify needed “tools” & “policies”
Accelerated Construction

TxDOT  Industry
Accelerated Construction

Construction Methods

Traffic Management

Work Zone Safety

Equipment

Materials

Economics
Introductions
District Workshops on Accelerated Construction

www.txdot.gov/business/resources/construction/regional-workshops.html
District Workshops on Accelerated Construction

www.txdot.gov/business/resources/construction/regional-workshops.html
District Workshops on Accelerated Construction
US History
AC-PP-17-02
David Newcomb

Abilene
MCM Elegante Suites
November 7, 2017
Accelerated Construction

U.S. History
History

- 1988 – GET-IN STAY – IN: GET-OUT STAY-OUT (NV)
- 1998 – GET-IN STAY – IN: STAY-OUT (CA)
- 1999 – TRB Task Force
- 2000 – Workshop to Define State-of-Practice (DC)
- 2002 – Accelerate Construction Technology Transfer (ACTT)
- 2002 – Workshops for Specific Project (IN) (PA)
- 2003 – Project Pegasus (TX) (IH 30 & IH 35E)
1990’s – 2000’s Driving Forces


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<table>
<thead>
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<tbody>
<tr>
<td>Vehicles Miles</td>
<td>+80 %</td>
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<tr>
<td>Drivers</td>
<td>+31 %</td>
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<tr>
<td>Lane Miles</td>
<td>+3.8%</td>
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</table>

**Aging System**

- 40 % Bridges +40 Years Old
- Pavements Exceeded Design Life
## Accelerated Construction Skill Sets

<table>
<thead>
<tr>
<th>• Financing</th>
<th>• Utilities</th>
<th>• Long Life Bridges</th>
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</thead>
<tbody>
<tr>
<td>• Contracting</td>
<td>• ROW</td>
<td>• Long Life Pavements</td>
</tr>
<tr>
<td>• Work Zone</td>
<td>• Railroad</td>
<td>• Quality Control</td>
</tr>
<tr>
<td>• Mobility</td>
<td>• Communication /Outreach</td>
<td>• Modular/Prefab Construction</td>
</tr>
<tr>
<td>• Corridor Improvement</td>
<td>• Training</td>
<td>• Constructability</td>
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<tr>
<td></td>
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<td>• Worker Health &amp; Safety</td>
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</tbody>
</table>
Peak-Period Congestion on NHS

Recurring Peak-Period Congestion

Uncongested

Congested

Highly Congested

2011

2040
Peak-Period Congestion on NHS

Recurring Peak-Period Congestion

- Uncongested
- Congested
- Highly Congested
Project Costs by Type, Related to Duration

- Total Cost
- Construction Cost
- Road User Cost
- Contract Administration Cost

COST

DAYS

0 A B C D
AR and LA - Rubblization Projects

• 300 Miles of Interstate Concrete Pavement (Decker and Hansen, 2005)
  - Rehabilitation needed
  - Slowest construction operation – demolition and removal
  - Rubblization kept in-place PCC to serve as high-quality base
  - Rate of production for rubblization = 1 lane-mile/day
    (twice the rate for PCC removal (Mn/DOT, 2005))

• Louisiana (Landers, 2011)
  - Used for I-55 (hurricane evac route)
  - Completed in seven months as opposed to 2-3 years for reconstruction
Wilmington, DE – I-95, 2000 (FHWA, 2003)

- $23.5 million - 2 years
- 24.4 lane-miles, 10 interchanges, bridge repairs, drainage improvements, lighting/safety
- AADT = 100,000 vpd (11% Commercial)
- Full road closure (reroute to I-495)
- Rubblilzation with asphalt overlay
- SB and NB I-95 closed 3 months each
- $25,000/day bonus for early completion, penalty for delay
- 75% reduction in duration (185 days)
- Detour - overall project costs increased
Maine – I-295, 2008 (Lane, 2009)

- 1970’s JRCP in S. Maine had ASR
- Important tourist route
- Remove top 3” JRCP, rubblize rest
- Full road closure, mid June – end of Aug
- Conventional lane closures = 3 construction seasons
- Traffic detoured on local roads – some improvements
- Incentive/disincentive up to $2 million
- Work completed 20 days ahead of schedule
- Contractor used up to 5 paving crews at once on project

Photo: MaineDOT
California I-15, (Anderson et al., 2005)

- Rebuild I-15
- Used 96-hr closures
- Compressed work from 8.5 months to 6 weeks
- Had contingencies for brush fires, weather, congestion, material shortage, etc.
- Selective use of rapid-curing cement
- Contractor flexibility – key to success
Austin Lamar Blvd. (Anderson et al. 2005)

• Complex project involving utilities
• Prequalified bidders
• Req’d 12-hr days, 7 d/wk (14 on/2off)
• 3 milestones with up to $120k bonus for each
• Penalty - $20k/day
• Urban area – intersections on weekend, noise mitigation at night
• PR campaign was successful
Summary

• Accelerated construction not new

• Requires
  ▪ Right application
  ▪ Incentives/disincentives
  ▪ Recognition of and planning for risks
  ▪ Flexibility on part of agency and contractor
  ▪ Innovative thinking
  ▪ Public engagement

• Will become more standard with time
Things Will Not Become Simple!

(a) Year 2011
(b) Year 2040

Recurring Peak-Period Congestion
- Uncongested
- Congested
- Highly Congested
TxDOT Interest in Accelerated Construction

AC-PP-17-03

Randy Hopmann

Abilene
MCM Elegante Suites
November 7, 2017
Outline

• Background
• Texas Landscape
• Texas History
• Opportunities
• Workshop Outcomes
## Project Delivery

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**Time**

- Letting
- Construction

*Texas A&M Transportation Institute*
## Economic Considerations-Examples

<table>
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<tr>
<th>Project</th>
<th>Per Month Costs</th>
<th>Project Costs</th>
</tr>
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<tbody>
<tr>
<td>Widen FM road from 2-lanes to 4-lanes (2.7 miles)</td>
<td>$ 96,000</td>
<td>$ 3.5M</td>
</tr>
<tr>
<td>Widen Freeway (2.6 miles)</td>
<td>$297,000</td>
<td>$17.8M</td>
</tr>
<tr>
<td>Interchange in urban area (1.5 miles)</td>
<td>$447,000</td>
<td>$ 5.1M</td>
</tr>
</tbody>
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Acceleration Goals

Good

- 20% reduction in time to complete project

Better

- 50% to 20% reduction in time to complete project
Economic Considerations - Stakeholders

- **Agency**
  - Extra engineering costs
  - Extra management
  - Price escalation
  - Safety

- **Public**
  - Time
  - Fuel
  - Vehicle Damage
  - Safety

- **Contractor**
  - Unproductive labor/equipment
  - Material inventory
  - Insurance/bonding capacity
  - Safety
Economic Consideration

• Direct project costs
  ▪ Agency
  ▪ Some contractor

• Indirect project costs (user/non-user)
  ▪ User fuel/time
  ▪ Roadside businesses
  ▪ Business efficiency (timely delivery)
  ▪ Some Contractor

All costs eventually borne by the public
Safety & Economics

- Reduce time traffic in work zone
- Traffic not in work zone
- Reduce user delay costs
  - Fuel
  - Time
- Vehicle maintenance
- User cost savings exceed construction costs
Reduce Construction Time

• Contracting methods
  ▪ Design/Bid/Build
  ▪ Cost-Plus Time (A+B)
  ▪ Interim completion dates
  ▪ No-excuses incentives
  ▪ Construction manager at risk
  ▪ Design/Build

• Lane occupancy time
  ▪ Off peak traffic
    • Day
    • Night
  ▪ Long weekend closures
  ▪ Close facility
Reduce Construction Time

• Bridges/Culverts (ABC)
• Pavements
Not for every project
Outline

• Background
• Texas Landscape
• Texas History
• Opportunities
• Workshop Outcomes
2017 Unified Transportation Program (UTP)

2017-2026
Transportation Planning & Programming
We Build Texas

Field Guide to
Successful Project Delivery

We build Texas – Safely
We build Texas – Quality
We build Texas – On Time
We build Texas – Together

Working together to successfully deliver projects.

Texas Department of Transportation

Associated General Contractors of Texas
Workforce
Outline

• Background
• Texas Landscape
• **Texas History**
• Opportunities
• Workshop Outcomes
• 1998 – Heald
  ▪ Legislators – TxDOT & User Costs for Liquidated Damage
  ▪ Commission – Reduce Construction Time
  ▪ Incentives/disincentives

• 2001 – Johnson’s “Transportation Working Group”
  ▪ Reduce project delivery time by 15% by 2006
  ▪ Address cost of disruption of traffic

• 2002 – Saenz
  ▪ Accelerated construction – Businesses & traffic flow impacted
  ▪ Calendar day definition of working day
  ▪ Milestones for incentives/disincentives
  ▪ Lane rental
  ▪ A+B
• 2003 – “Accelerated Construction Strategies Guidelines”

• 2004 – Saenz
  ▪ Use accelerated construction on
    • High traffic locations
    • Significant impact on safety or businesses
    • Other project specific reasons

• 2009 – Bohuslav – AASHTO Scan Tour

Amadeo Saenz
Katy Freeway (IH-10)

- Traditional construction – 12 years
- Accelerated construction – 6 years
Katy Freeway (IH-10)

- 23 miles
- 280,000 VPD
- $2.6 billion
  (2/3 construction)
- 6 years vs 12 years
Katy Freeway Economics

- $150 - $200 million/year
- Accelerated construction benefit - $2.8 billion
- Cost of accelerated construction - $309 million
- B/C ratio – 9.0
Outline

• Background
• Texas Landscape
• Texas History
• **Opportunities**
• Workshop Outcomes
Materials

- Strength gain (time, temp)
- Removal
- Production
- Transportation
- Placement
Equipment

• Materials handling
• Demand for equipment
• Prototype/production unit/redesign
• Cost
Process Control/Quality Control

• High production/placement rates
• Rapid tests
• Quick feedback to produce quality
• Management to insure quality
Traffic Control

- Place/remove quickly
- Moving construction zone
- Protect driver/contractor workforce
Workforce

• Skill set
  ▪ New equipment
  ▪ New materials
  ▪ QC/QA

• Congested work zone

• Shift length

• Housing/facilities
• Personal life
• Management team
• Financial
Economic Incentives - Contractor

- One job/occasional job
- Return on investment (equipment)
- Bonding capacity
- Backlog of work
- Risk
Key Items

• Project selection & planning
• Contracting methods
• Design - Simpler design = faster construction
• Contractor selection
• Construction considerations
Planned Accelerated Construction

- TxDOT champion
- TxDOT/FHWA support team available
- Vision – goals & objectives
- Policies & procedures
- Partnering
- Alternative contracting methods
- Cultural change
Planned Accelerated Construction (Cont’d)

• New technologies
• Total costs – Agency, construction, user, non-user, safety environmental
• Engage construction & materials industries
• Performance measures
• Learn from past & improve
Keys to Accelerated Construction

• Consider accelerated construction in planning stage
• Isolate construction work from traffic
• Reuse existing materials on site
• Maintain lane closure as long as possible
• Innovative approaches to traffic handling
Outline

• Background
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Workshop Goals

• Information sharing

• Existing TxDOT “tools”

• Identify needed “tools” & “policies”
CAUTION

Not All Projects Are Suitable for Accelerated Construction
District Workshops on Accelerated Construction

Abilene
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November 7, 2017
District Workshops on Accelerated Construction Economic Screening Tools
AC-PP-17-04
David Ellis
Brianne Glover
Abilene
MCM Elegante Suites
November 7, 2017
Project Level Economic Screening Tool

• Benefit-Cost tool

• Focus – road user costs and economic losses
Project Level Economic Screening Tool

Inputs

• Traffic Data
• Geographic Location
• Cost to Accelerate Construction
• Project Timing
• Construction Segments
• Adjacent Retail Businesses
Project Level Economic Screening Tool

- **Urban:** Major metropolitan and urban areas
- **Suburban:** Areas adjacent to major metropolitan and urban areas
- **Rural:** Areas outside of urban and suburban areas
### Project Level Economic Screening Tool

#### Preconstruction Conditions

<table>
<thead>
<tr>
<th>Project Parameters</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Operating Speed</td>
<td>50</td>
</tr>
<tr>
<td>Segment Length (miles)</td>
<td>6.0</td>
</tr>
<tr>
<td>Pre Construction ADT</td>
<td>215,000</td>
</tr>
<tr>
<td>Percent Trucks</td>
<td>15%</td>
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<tr>
<td>Project Region</td>
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</tr>
<tr>
<td>Retail (SQFT)</td>
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<tr>
<td>Travel Time per Trip (minutes)</td>
<td>7.2</td>
</tr>
</tbody>
</table>

#### Traditional Construction Parameters

<table>
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<tr>
<td>Total Project Period (calendar days)</td>
<td>900</td>
</tr>
<tr>
<td>Percent of ADT that is Traveling During Peak Periods</td>
<td>75%</td>
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</tbody>
</table>

<table>
<thead>
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<th>Accelerated Construction Parameters</th>
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<tbody>
<tr>
<td>Added Cost of Accelerate Construction</td>
<td>$200,000,000</td>
</tr>
<tr>
<td>Added Cost of Incentives</td>
<td></td>
</tr>
<tr>
<td>Total Project Period (calendar days)</td>
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<td>Automobile Travel Time Value</td>
<td>$331,828,313</td>
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<tr>
<td>Truck Travel Time Value</td>
<td>$102,219,084</td>
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<tr>
<td>Total Travel Time Value</td>
<td>$434,047,397</td>
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<tr>
<td>Automobile Operating Cost</td>
<td>$99,277,110</td>
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<td>Truck Operating Cost</td>
<td>$78,576,480</td>
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<td>Total Operating Cost</td>
<td>$177,853,590</td>
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<td>Automobile Travel Time Value</td>
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<td>Truck Travel Time Value</td>
<td>$41,455,517</td>
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<td>Automobile Operating Cost</td>
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<td>Total Operating Cost</td>
<td>$72,129,512</td>
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<tbody>
<tr>
<td><strong>Segment 1:</strong></td>
<td>Days</td>
<td>450</td>
<td>Days</td>
<td>180</td>
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<tr>
<td></td>
<td>Segment Length</td>
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<td>10</td>
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<td>45</td>
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<tr>
<td></td>
<td>Percent of Traffic Diverted</td>
<td>20%</td>
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<tr>
<td><strong>Segment 2:</strong></td>
<td>Days</td>
<td>450</td>
<td>Days</td>
<td>185</td>
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<tr>
<td><strong>Segment 3:</strong></td>
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<td>Days</td>
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<td><strong>Segment 4:</strong></td>
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</tbody>
</table>
Project Level Economic Screening Tool

- Sales
- State Sales Tax Revenue
- Local Sales Tax Revenue
<table>
<thead>
<tr>
<th>Results</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Traditional Construction Tools</strong></td>
<td></td>
</tr>
<tr>
<td>Total Road User Costs and Economic Loss</td>
<td>$1,832,284,439</td>
</tr>
<tr>
<td><strong>Accelerated Construction Tools</strong></td>
<td></td>
</tr>
<tr>
<td>Total Road User Costs and Economic Loss</td>
<td>$ 771,059,803</td>
</tr>
<tr>
<td><strong>Traditional vs Accelerated</strong></td>
<td></td>
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<tr>
<td>Change in Road User Costs and Economic Loss</td>
<td>$1,061,224,636</td>
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<tr>
<td>Road User Cost and Economic Daily Cost</td>
<td>$ 1,983,597</td>
</tr>
<tr>
<td>B/C of Accelerated construction</td>
<td>5.31</td>
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</tbody>
</table>
Estimated User Costs and Economic Losses

- Traditional: $1,832,284,439
- Accelerated: $771,059,803

- Travel Time Value
- Operating Costs
- Loss of Sales
- Loss of Tax Revenue
- Cost to Accelerate
District Workshops on Accelerated Construction

Contacts

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b-glover@tamu.edu

David Ellis  
d-ellis@tamu.edu

Abilene  
MCM Elegante Suites

November 7, 2017
District Workshops on Accelerated Construction Project Development
AC-PP-17-05
Michael Bostic

Abilene
MCM Elegante Suites
November 7, 2017
OUTLINE

• Project Selection and Planning
• Contracting Methods
• Design
• Contractor Selection
• Involvement of Contractor
• Construction Considerations
• Project Development Process Manual-2017
• Bridge Project Development Manual-2016
• PS&E Preparation Manual-2016
• Roadway Design Manual-2014
• Bridge Design Manual-2015
• Bridge Detailing Guide-2016
• Pavement Design Manual-2011
• Hydraulic Design Manual-2016
• Texas Manual on Uniform Traffic Control Devices -2014
• Accelerated Construction Strategies Guidelines – (Under Revision)
PROJECT SELECTION & PLANNING

• General Guides
• Economic Considerations
• ROW, Utilities, Environmental & Railroads
• Risk Assessment
• Public Information
• Other
Project Selection & Planning

General Guidelines

- FHWA
  - High Traffic - generally urban areas
  - Complete a “gap” in a highway system
  - Major project that will disrupt traffic
  - Major bridges out of service
  - Lengthy detour required
PROJECT SELECTION & PLANNING

General Guidelines

• TxDOT-2003
  • Interstates with lane closures
  • Bridge closure
  • Road closure
  • Added capacity project
  • Non-freeway with ADT>10,000 & lane closures
  • Restrict access to schools, emergency services, etc.
  • Affect adjacent businesses
General Guidelines

• Rural areas
  • Impact on small towns traffic flow
  • Impact on small town businesses
  • Intersections

• Key transportation routes for major industries
  • Energy development
  • Agriculture
  • Mining
Economic Considerations

• Agency Administrative Costs
• Road User Costs
• Non-User Costs (adjacent businesses)
• Construction Costs
• Contractor Management Costs
Calculation Tools

• TxDOT Road User Cost Calculator

• Project Level Economic Screening Tool

Estimated User Costs & Economic Losses

Traditional

Accelerated
PROJECT SELECTION & PLANNING

- ROW
- Utilities
- Environmental
- Historical Preservation
- Archeology
- Railroad
Public Information

• Early and often
• Involve public during planning stages
• Short term inconvenience for long term convenience
• Use of coordinator
Contracting Methods

TxDOT Guides

• Calendar day definition for working day
• Incentive Using
  • Contract administration liquidated damages
  • Road user costs
• Milestones with Incentives/Disincentives
• Substantial Completion Incentives/Disincentives
• Lane Rental Disincentive
• A+B Provisions
• Design-Build
Contracting Methods

Selection of Contracting Method

• Influencing factors in selection of method
  • Project size
  • Project type - new construction, rehabilitation, etc.
  • Project complexity
  • Critical completion time
A+B Contracting

- A - Traditional bid for the unit prices multiplied by the contract quantities
- B - Time to complete the project x daily road user costs
- Road user costs provided by TxDOT
- Contract state minimum and maximum work days
- Contractors bids “time” is the “time” used for contract cost adjustments
DESIGN

• General Considerations
• Geometric Design
• Bridge Design
• Drainage Design
• Pavement Design
• Roadside Safety Design
• Traffic Control and Job Sequencing
• Project Duration
Traffic Control and Job Sequencing

- Texas Manual on Uniform Traffic Control Devices
- Deployment and removal time for traffic control devices
- Design for safety (speed if possible as public will push the speed limits)
- Constructability review
CONTRACTOR SELECTION

TxDOT Prequalification
• Confidential Questionnaire
  • Audited financial statement
  • Completion of questionnaire
• Bidder’s Questionnaire
  • Confidential questionnaire waived
  • Smaller projects, routine maintenance, emergency, specialty projects
Contractor Selection

Possible Future Considerations

• Quality
• Past performance
• Safety
• Special technical capabilities
• Key personnel
Involvement of Contractor

• Planning and Design Reviews
• Partnering
• Workforce
Planning and Design Reviews

• More early and detailed reviews by TxDOT
• Provide state wide resource of experienced engineers, etc.
• Include contractors, materials suppliers, fabricators, equipment manufacturers, transportation companies
Partnership

- Agreement to
  - Solve issues at low level in organizations
  - Openness to change as information becomes available
  - Attention to detail
  - Focus on project with unselfish effort
  - Take steps to ensure that no interruptions take place
  - Co-locate key personnel on project
  - Empower workforce to make immediate decisions
  - Technical expertise on job site or immediately available
  - Include all stakeholders-TxDOT, contractors, materials suppliers, fabricators, local governments, utility companies, trucking companies
INVolvement of Contractor

Workforce

• Extended hours
• Rapid pace
• Worker fatigue
• Redundant critical personnel
• Hand-off work between shifts
• Equipment maintenance
CONSTRUCTION CONSIDERATIONS

• General Considerations
• Work Plan and Work Sequence
• Workforce
• Work Space
• Equipment
• Quality Control/Quality Assurance
• Information Exchange
CONSTRUCTION CONSIDERATIONS

General Considerations

• “We Build Texas-Field Guide to Successful Project Delivery”

• Key elements of successful project
  • Safety
  • Money
  • Timeliness
  • Relationships
  • Perception
  • Quality
CONSTRUCTION CONSIDERATIONS

General Considerations

• Activities that produce successful project
  • Contract Relationships
  • Activities Prior to Letting
  • Post-Letting to Contractor Start Activities
  • Construction Start to Contract Completion Activities
CONSTRUCTION CONSIDERATIONS

- Work Plan and Work Sequence
- Workforce
- Workspace
- Equipment
- QC/QA
- Information Exchange
Summary

• Project Selection and Planning
• Contracting Methods
• Design
• Contractor Selection
• Involvement of Contractor
• Construction Considerations
District Workshops on Accelerated Construction

Abilene
MCM Elegante Suites
November 7, 2017
ACCELERATED BRIDGE CONSTRUCTION IN TEXAS (AND BEYOND)
Accelerated Bridge Construction (ABC) Techniques

1. Prefabricated Elements
2. Self Propelled Modular Transporters (SPMTS)
3. Modular Units
4. Lateral Slide-in Bridge Construction

Photo Courtesy of FHWA
Prefabricated Elements

- TxDOT’s primary technique for accelerated bridge construction.
- In addition to increased speed, also typically comes with increased quality.
- Can encompass practically every element from the ground up.
TxDOT’s Bread & Butter: Girders and Deck Panels
Precast Bent Caps
Precast Bent Caps – Long Water Crossings
Precast Abutments
Precast Columns
Moving Forward

- Prefabricated elements are largely what make TxDOT bridges the least expensive and most durable in the country. Keep it up!

- Prefabricated elements typically speed up construction considerably, but typically do not really constitute “Accelerated Bridge Construction.”

- Now let's talk fast!
Decked Slab Beams
Decked Slab Beams: 6 – 10 Day Construction Projects

FM 1660
Cottonwood Creek
(AUS)

Precast Abutment

Decked Slab Beams

Precast Bent Cap

Steel Piling
Full Width, Full Depth Panels

SH 290
Live Oak Creek
(SJT)
Self Propelled Modular Transporters (SPMT)

Photos Courtesy of Heavy Equipment Guide
SPMT – Fort Worth West 7th Street Arches
Modular Units – I-93 Fast 14 in Boston
Modular Units – I-93 Fast 14 in Boston

New Bearing Seat

Existing Cap
Modular Units (No Deck) – West Dallas St. in Houston
Modular Units – West Dallas St. in Houston
Modular Units – West Dallas St. in Houston
Lateral Slide-in

Re-use of Existing Substructure

New Bridge under Construction
Lateral Slide-in – LP 345 / Fredericksburg Rd (San Antonio)
Lateral Slide-in – LP 345 / Fredericksburg Rd (San Antonio)
Lateral Slide-in – LP 345 (San Antonio)
Lateral Slide-in – LP 345 (San Antonio)
QUESTIONS?
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ACCELERATED BRIDGE CONSTRUCTION
ABILENE DISTRICT

Daniel P. Richardson, P.E., CFM
Director of Operations – ABL
Contracting Methods used for Accelerated Bridge Construction – ABL

- Cost-Plus Time (A+B)
- No Excuses Incentive/Disincentive
- Interim Phase Completion using Milestones with Incentives
- Lane Rentals
- 6-day and 7-day Workweek Schedule
- Off peak traffic work schedule with Incentive
- Use of Pre-Cast Bridge Elements
PROJECT INFORMATION

Project:  BR 2014 (849)
Control:  0006-18-050
Highway:  US 84 / BI-20 R
Limits:  At UPRR & Old Hwy 80
Layman’s Description:  Replace Existing Bridge and Approaches
Letting Date:  February 4, 2015
Rational for Use of Accelerated Contracting Provisions

- Phased Construction was not possible
- Full Highway Closure with Off-Site Detour was Required
- Existing Pavement Structure on Detour Route
- Facility is on the NHS/STRAHNET with significant ADT
- 1 of only 3 Highway Connections to West-Central & Southwest Abilene
- Construction of an Overpass at Class 1 Railroad with 27+ Trains/Day ($1500/day RR flagging)
Strategies for Accelerated Construction Used

- Mandatory Pre-Bid Conference
- A+B Bidding
- Minimum/Maximum Days allowed
- 6-Day Workweek Calendar
- No Excuses Incentive/Disincentive Provisions
Mandatory Pre-Bid Conference

**Intent:** Discuss A+B bidding concept, bidding provisions and expectations of district

### A + B Bidding

**Definition of A Component** (Contract Amount):

Summation of item plan quantities x unit bid prices

**Definition of B Component** (Time Element):

Multiply # of days bid to substantially complete project x Daily Road-User Cost (RUC)

**Determination of Lowest Bid:** A Component + B Component
Mandatory Pre-Bid Conference

- Proposals received from contractors not attending this meeting will be rejected.
- This contract includes provisions for A+B bidding in accordance with special provisions (2004 Specs):
  - 002-042 (Determination of Low Bid)
  - 008-069 (No Excuse Incentive/Disincentive)
  - 008-150 (Working Day Determination, Failure to Complete on Time (RUC/LD))
- The maximum number of days allowed for contract completion shall be 317 working days.
- The minimum number of days allowed for contract completion shall be 156 working days.
- The daily road-user cost (RUC) shall be $11,307 per day.
### ROAD USER COST ANALYSIS FOR 0006-18-050

#### TRAFFIC DATA FROM STATEWIDE PLANNING MAP

<table>
<thead>
<tr>
<th>Year</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
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<td>9400</td>
<td>9400</td>
<td>10482</td>
<td>10407</td>
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<table>
<thead>
<tr>
<th>Normal Route</th>
<th>Dist (FT)</th>
<th>Changed Route</th>
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<tbody>
<tr>
<td>IH 20 TO BI-20R via US 84</td>
<td>22400</td>
<td>IH 20 TO FM 3438</td>
<td>16400</td>
</tr>
<tr>
<td>FM 3438 TO BI-20R</td>
<td>9000</td>
<td></td>
<td></td>
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</table>

#### CARS - EACH DIRECTION OF DETOUR

<table>
<thead>
<tr>
<th>Route</th>
<th>Feet</th>
<th>Miles</th>
<th>Speed (mph)</th>
<th>Travel time (hrs)</th>
<th>Stopped time (hrs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IH 20 TO FM 3438</td>
<td>16150</td>
<td>3.0587</td>
<td>75</td>
<td>0.0408</td>
<td>0.0083</td>
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<tr>
<td>Decel</td>
<td>250</td>
<td>0.0473</td>
<td>30</td>
<td>0.0016</td>
<td>0.0035</td>
</tr>
<tr>
<td>Stop</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accel</td>
<td>250</td>
<td>0.0473</td>
<td>30</td>
<td>0.0016</td>
<td>0.0035</td>
</tr>
<tr>
<td>FM 3438 TO BI-20R</td>
<td>8500</td>
<td>1.6098</td>
<td>45</td>
<td>0.0358</td>
<td>0.0083</td>
</tr>
<tr>
<td>Decel</td>
<td>250</td>
<td>0.0473</td>
<td>30</td>
<td>0.0016</td>
<td>0.0035</td>
</tr>
<tr>
<td>Stop</td>
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<tr>
<td>Accel</td>
<td>250</td>
<td>0.0473</td>
<td>30</td>
<td>0.0016</td>
<td>0.0035</td>
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#### TRUCKS - EACH DIRECTION OF DETOUR

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<th>Route</th>
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<th>Speed (mph)</th>
<th>Travel time (hrs)</th>
<th>Stopped time (hrs)</th>
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<tr>
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<td>Decel</td>
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<tr>
<td>Accel</td>
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<td>0.0473</td>
<td>30</td>
<td>0.0016</td>
<td>0.0035</td>
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<tr>
<td>FM 3438 TO BI-20R</td>
<td>8500</td>
<td>1.6098</td>
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<td>0.0083</td>
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<td>Decel</td>
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<td>0.0473</td>
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<tr>
<td>Accel</td>
<td>250</td>
<td>0.0473</td>
<td>30</td>
<td>0.0016</td>
<td>0.0035</td>
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</table>

#### NUMBER OF VEHICLES TAKING DETOUR

<table>
<thead>
<tr>
<th></th>
<th>Travel Time/CAR</th>
<th>0.0995 HRS</th>
<th>Delay Time/CAR</th>
<th>0.0430 HRS</th>
<th>Number of Vehicles Taking Detour</th>
<th>10400.00</th>
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<tbody>
<tr>
<td>% Cars</td>
<td>74.50</td>
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<tr>
<td># Cars</td>
<td>7748.00</td>
<td></td>
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<td></td>
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<tr>
<td>Time (all Cars)</td>
<td>332.94</td>
<td></td>
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<tr>
<td>Cost (all Cars)</td>
<td>$7,234.84</td>
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</table>

#### TOTAL ROAD USER COST/DAY

11,307.11
### CST Determination of Low Bid

<table>
<thead>
<tr>
<th>BIDDER</th>
<th>A (bid items)</th>
<th>% O/U</th>
<th>Days Bid</th>
<th>Road User Cost (RUC)</th>
<th>B (days x RUC)</th>
<th>Total A + B</th>
<th>% O/U</th>
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<tbody>
<tr>
<td>ENG ESTIMATE</td>
<td>$8,008,790.08</td>
<td>------</td>
<td>317</td>
<td>$11,307.00</td>
<td>$3,584,319.00</td>
<td>$11,593,109.08</td>
<td>------</td>
</tr>
<tr>
<td>Bidder # 1</td>
<td>$8,999,252.10</td>
<td>12.37%</td>
<td>208</td>
<td>$11,307.00</td>
<td>$2,351,856.00</td>
<td>$11,351,108.10</td>
<td>-2.09%</td>
</tr>
<tr>
<td>Bidder # 2</td>
<td>$10,567,670.56</td>
<td>31.95%</td>
<td>300</td>
<td>$11,307.00</td>
<td>$3,392,100.00</td>
<td>$13,959,770.56</td>
<td>20.41%</td>
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<tr>
<td>Bidder # 3</td>
<td>$11,265,763.32</td>
<td>40.67%</td>
<td>300</td>
<td>$11,307.00</td>
<td>$3,392,100.00</td>
<td>$14,657,863.32</td>
<td>26.44%</td>
</tr>
</tbody>
</table>
Contract Provisions

- Working days will be computed and charged in accordance with Item 8, Article 8.3.A.2., **6-Day work week** and other provisions provided in Article 8.11. No time charge adjustment will be made for railroad issues.

- A No Excuse Early Substantial Completion of Work Incentive will be paid in accordance with section 8.11.A.2 of special provision 008-069 using a daily road-user cost (RUC) of $11,307 per day. The maximum number of working days for computing the incentive credit for the Early Substantial Completion of Work is 20 days. The total sum of the incentive available to the contractor shall not exceed $226,140.

- A Disincentive for Failure to Substantially Complete Work on Time will apply to this contract in accordance with section 8.11.B of special provision 008-069 using a daily road-user cost (RUC) of $11,307.

- **Substantial Completion of Work** shall be defined as the completion of all work specified in the contract, and time is suspended for the final acceptance process in accordance with item 5.8.B.1. Vegetative establishment and maintenance, test and performance periods will be excepted out as a requirement for substantial completion.
Project Summary

- Engineers Estimate: $8,008,790.08
- Contract Award Amount: $8,999,252.10
- Change Orders: 3 - $120,733.88 (1.34%)
- Adjusted Contract Amount: $9,119,985.98
- Work Begin Date: May 26, 2015
- Substantial Completion of Work Date: December 23, 2015
- Contract Time: 208 days
- Days Charged: 175 days (84.13%)
- Incentive Paid: $226,140.00 (2.5% of Contract Amt.)
- Contractor Payout Total: $9,469,161.44 *

*Includes Safety Contingency & Erosion Control Force Account, ACP Production/Placement Bonus
Acceleration Goals

Actual Completion Time vs. Average Work Schedule

- Traditional Schedule - 317 days
- Contract Days Bid - 208 days
- Actual Completion - 175 days

44.8% reduction (142 days)
Accelerated Project Evaluation

- Project Completion: 7 months (Accelerated) vs. 18 months (Traditional)
- Reduction in Road-User Costs: 142 days @ $11,307/day = ($1,605,594)
- Reduction in RR Flagging Expenses: 142 days @ $1,500/day = ($213,000)
- Incentive Pmnt for Early Completion: 20 days @ $11,307/day = $226,140

Net Value: $1,592,454

Safety

1. Contractor and TxDOT Employees
2. Traveling Public
3. Railroad Operations
Looking East at Substantial Completion Date
Looking North at Substantial Completion Date
Looking Northwest at Substantial Completion Date
Recent ABL Projects with Accelerated Contract Provisions

- FM 2836 @ Cherry Creek (CSJ: 2331-01-014) Replace Bridge (Dec 2015 let)
- US 87 Truck Relief Route (CSJ: 0908-12-022) Construct New Relief Route (Sept 2016 let)
- IH-20 @ SH 351 (CSJ: 0006-06-099, etc.) Replace Twin Bridges/Reconstruct Urban Intersection (Oct 2016 let)
- IH-20 (CSJ: 0006-03-132) Reconstruct Roadway (Mar 2017 let)
- US 83 @ Southwest Drive (CSJ: 0034-01-129) Reconstruct Urban Intersection (June 2017 let)
- BI-20 M (Broadway St) @ UPRR (CSJ: 0006-15-034) Replace Bridge and Approaches (Jan 2018 let)
ACCELERATED CONSTRUCTION STRATEGIES - DESIGN

Chris Graf, PE – Brownwood District
Design Considerations

- General Design Considerations
- Pavement Selection and Design
- Horizontal and Vertical Alignment
- Traffic Control Plan
- A+B Bidding / Milestones
General Design Considerations

- Simple
- Standard
- Repeatable
- Precast
- Letting Date
- Donation Agreement
- Pavement Selection and Design
- Material Selection

<table>
<thead>
<tr>
<th>Bid Days</th>
<th>Working Days Charged</th>
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</thead>
<tbody>
<tr>
<td>43</td>
<td>41</td>
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</table>
- Horizontal Alignment
- Vertical Alignment
- TCP Phasing
- Work Space
## A+B Bidding / Milestones

<table>
<thead>
<tr>
<th>Project CSJ</th>
<th>Roadway</th>
<th>Calendar Days Allowed</th>
<th>Bid Days</th>
<th>Incentive Milestones</th>
<th>Max Incentive</th>
<th>Incentive Received</th>
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<tbody>
<tr>
<td>0007-06-086</td>
<td>IH 20</td>
<td>73 - 133</td>
<td>133</td>
<td>RUC Incentive for substantial completion</td>
<td>$34,890</td>
<td>$34,890</td>
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<tr>
<td>0007-06-084</td>
<td>IH 20</td>
<td>914 - 1094</td>
<td>914</td>
<td>CALD Incentives for 2 milestones</td>
<td>$155,400</td>
<td>TBD</td>
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</tbody>
</table>
Questions

Chris Graf, PE
District Design Engineer
Brownwood District
Phone: (325) 643-0441
Email: chris.graf@txdot.gov
TRAFFIC AND SAFETY

Accelerated Construction Workshop
Paul N. Norman, P.E.
“GET-IN, GET-OUT, STAY-OUT”
Accelerated Construction
Safety and Traffic

Planning

ROAD CLOSED

ROAD CLOSED

WORK CONVOY
Design

Safety and Traffic
Safety and Traffic

Design
NOTES:
1. VARIOUS DESIGN CHANGES IN EXISTING 24" RD ROLL CONCRETE CURB AND GUTTER Propose 4" ROLL OF APPEASATY 2".

Legend:
- REMOVING STD ROLL & CURB GAP
- REMOVING CURB/GUTTER
- REMOVING RD ROLL & CURB GAP
- REMOVING STD ROLL & CURB GAP

Design:
- Safety and Traffic

Footer Text
Safety and Traffic

Contracting

- Choosing the right strategy
  - Calendar Day
  - A+B Bidding
  - Incentive/Disincentive
  - **Milestone**
  - Lane rentals
Safety and Traffic

Implementation
Safety and Traffic

Implementation
Safety and Traffic

Evaluation
Safety and Traffic

Evaluation
Safety and Traffic

Evaluation
PUBLIC OUTREACH DURING CONSTRUCTION

Karen A. Threlkeld, APR
Public Information Officer, San Angelo District
Construction Acceleration in West Texas

- Modifications to Traffic Control Plans
- Reconstruction of a major intersection over a weekend
- Paving at night
- Reconstruction of major business driveways full-width instead of halves
Roller Compacted Concrete – Two mile section
Pilot paving project
The Power of Boots on the Ground

Jayme Wooten, inspector
US 83 – Real County
Repainting the Historic Truss Bridge in Kimble County
Abilene Accelerated Construction Workshop

November 7, 2017

Rural Newspapers

Lead found on park playground equipment

Chemical analysis shows presence of unacceptable levels of lead dust.

Debbie Cooper Kistler
The Junction Eagle


Bridge refurbishing project worsens

In addition to the list of problems outlined with getting and keeping the bridge refurbishing project moving forward, the Texas Commission on Environmental Quality (TCEQ) has issued a NOI. The NOI states that the bridge will be looking for additional information on the bridge and the water level in the river.

Debbie Cooper Kistler
The Junction Eagle


TxDOT removes giant pecans for better view?

The view coming into Junction over the South Llano Bridge was changed last week to include an expansive look at the river. Several electrical poles were moved to serve the Lopez Lake RV Park and a number of dying trees, all on private property. Now there are also large tree stumps in the Texas Department of Transportation right-of-way where 12 giant, 75-year-old native pecan trees used to be.

Debbie Cooper Kistler
The Junction Eagle

The view was the problem, not the trees. The trees were part of the natural landscape and do not obstruct the view. TxDOT removed the trees to improve the view of the river for visitors. The trees were healthy and had no significant impact on the roadway. The stumps will be removed in the future.

Debbie Cooper Kistler
The Junction Eagle

According to TxDOT, the removal of the trees is part of the ongoing maintenance and improvement of the bridge. The trees were located in the right-of-way and were obstructing the view of the river. The removal of the trees was necessary to ensure the safety of the public and to improve the aesthetics of the bridge.

Debbie Cooper Kistler
The Junction Eagle

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Repainting the Historic Truss Bridge in Kimble County
Completed Truss Bridge in Kimble County
BU 67 Sherwood Way Project San Angelo

- PIO and Assistant Area Engineer met with local businesses prior to construction ✓
- Email updates ✓
- News Media interviews ✓
- Stakeholder meetings ✓
How we’ve evolved...

Radio → Newspaper → Television

Social Media

Radio: Twitter
Newspaper: Facebook
Television: Instagram
Social Media: YouTube
Hurricane Harvey Social Media

We've deployed 17 personnel and 12 pieces of equipment this morning to San Antonio for Hurricane Harvey recovery.
Project Social Media

No more flashing yellow! The new traffic signal on Sherwood Way will be fully functioning tomorrow!
Comparing Two Events

Twitter Analytics

- **Media Views**
  - Signal: Low
  - Harvey: Moderate

- **Impressions**
  - Signal: Low
  - Harvey: High

Chart showing comparison between Signal and Harvey in terms of Media Views and Impressions.
Facebook as a Tool

Bruce Carr • Real County
September 12, 2016 at 7:10am

Good morning TxDOT will be starting road construction this morning on US83 around the south city limits. Expect traffic control and single lane traffic in that area.

Bruce Carr
June 6, 2016

RR 1120 at Hwy 83 closed due to roadway separation please use alternate routes
The pavement did not stick properly and is coming up. Please let TxDot know of any other roadway problem such as RR 336 should you run across this

James Couvillon • Real County
April 4 at 5:10pm

TxDot is resurfacing on 83 south from Uvalde county line to the 1050 turn. It’s down to 1 lane with a pilot car. Slow down and leave early if you need to be somewhere south! It takes a few minutes to get... 😊 See more
Life Cycle of a Successful Project

Area Engineers & Inspectors -> PIOs -> Construction Project -> Contractor

- Contractor
- Community
- Law Enforcement
- Schools
- News Media
Your PIO can help you!
District Workshops on Accelerated Construction
Regional Workshop Exercises
AC-PP-17-11
David Newcomb
Abilene
MCM Elegante Suites
November 7, 2017
Typical Projects

A. Pavement Strengthening
B. Pavement Widening
C. Rural Intersection Reconstruction
D. Bridge Widening
E. Small Town Main Street
F. Suburban/Rural Road Widening
## Breakout Groups

<table>
<thead>
<tr>
<th>Breakout Groups</th>
<th>Facilitator</th>
<th>Recorder</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-Pavement Strengthening</td>
<td>Ryan Sales-TxDOT, Big Spring AO, ABL</td>
<td>Gary Enos-TxDOT, District Design Engineer, SJT</td>
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<tr>
<td>B-Pavement Widening</td>
<td>John Speed- TxDOT, District Engineer, ODA</td>
<td>Allan Moore-TxDOT, Director of Construction, WFS</td>
</tr>
<tr>
<td>C-Rural Intersection Reconstruction</td>
<td>Bart Fris- TxDOT, Brownwood AE, BWD</td>
<td>Will McLane-TxDOT, San Angelo Asst. AE, SJT</td>
</tr>
<tr>
<td>D-Widening Bridge</td>
<td>Mike Beaver- TxDOT, District Bridge Engineer, WFS</td>
<td>Kristi Harwell-TxDOT, Office Manager, ABL</td>
</tr>
<tr>
<td>E-Small Town Intersection</td>
<td>Stuart Withington- TxDOT, San Angelo AE, SJT</td>
<td>Dan Hohmann-TxDOT, Brownwood Asst. AE, BWD</td>
</tr>
<tr>
<td>F- Suburban/Rural Widening</td>
<td>Marshall Heap-Junction Asst. AE, SJT</td>
<td>Fred Herrera-TxDOT, Midland AE, ODA</td>
</tr>
</tbody>
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**Exercise A: Pavement Strengthening**

**Project Details:**

**Work**
- Project length: 6 mi.
- Existing: 11” asphalt, over 8” flexible base
- Mill & remove 3” & replace with 4” AC or 6” PCC
- Shoulders to match
- Soil: Expansive clay

**Traffic:**
- AADT = 60,000
- Peak: M-F
  - 6:30 am to 9:00 am
  - 4:00 pm to 6:30 pm
- Possible Detours:
  - Frontage road, busy downtown on wkends, ramps @ 1 mi. interval

**Geometric Design:** High speed freeway design

**Drainage:** Drainage structures: adequate

**Utilities:** Not an issue on project

**Economics:** Approx. $5 M in user & non-user costs savings possible with aggressive accelerated construction schedule
**Exercise B: Pavement Widening**

**Project Details:**

**Work**
- Project length: 6 mi.
- Existing: 11” concrete over 4” base
- Add 12’ lane + 4’ shldr to inside
- Alt: 8” AC/6” flex base or 8” JPCP/4” Type B
- New concrete median between directions
- Trucks not allowed on inside lane
- Soil - Expansive clay

**Traffic**
- AADT = 75,000
- Peak: M-F
  - 6:00 am to 9:30 am
  - 4:00 pm to 7:00 pm
- Weekend heavy not congested

**Possible Detours:**
- Frontage road requires strengthening, ramps @ 1.5 mi. interval

**Geometric Design:** High speed freeway design

**Drainage:** Drainage structures adequate. Must be relocated from median area

**Utilities:** Electrical for highway lighting

**Economics:** Approx. $40 M in user & non-user costs savings possible with aggressive accelerated construction schedule
Exercise C: Rural Intersection Reconstruction

Shaded Area for Reconstruction

Project Details:

Work
• Project: Shaded Area
• Existing: 4” AC/6” flex base
• Fix: 8” AC or PCC/remaining material
• Soil: Silty sand

Traffic
AADT = 12,000 for 4-lane; 3,000 for 2-lane
Peak: M-F 6:30 am to 9:00 am & 4:00 pm to 7:00 pm,
Weekend heavy traffic to recreational lake on 2-lane roadway

Possible Detours: Result in additional 15 miles

Geometric Design: No sight distance problem
Drainage: Drainage away from intersection with drop inlets
Utilities: Limited electrical, cable removed & relocated
Economics: Approx. $300 K in user & non-user costs savings possible with aggressive accelerated construction schedule
Exercise D: Standard Bridge Overpasses – Widening Medium Span Bridges and Solutions for Replacing Short- and Medium-Span Bridges

**Project Details**

*First part of exercise focuses on widening existing bridge to add more lanes for increased capacity*

- **Setting** - Suburban area
- **Existing bridge**
  - Medium-span lengths (80-120 ft)
  - Simply supported prestressed concrete I-girder construction
  See figure for typical transverse section (girder type can vary)
  - Deck: reinforced concrete with precast concrete stay-in-place forms and an asphalt overlay.

- **Traffic** - AADT = 15,000
  - Peak M-F
    - 6:30 am – 9:00 am
    - 4:00 am - 7:00 pm
- **Economics**: Approx. $5 M in user & non-user costs savings possible with aggressive construction schedule

*Discussion will be expanded to discuss alternatives and challenges for full replacement of short- and medium-span bridges*
Project Details:
Work
• Project length: 2 mile
• Existing: 4” AC/6” flex base, No curb/gutter
• Replace 4’ sidewalk with curb/gutter

Traffic
AADT = 3,000 for main road, 500 for crossroads
Peak: M-F 7:00 am to 9:00 am & 4:30 pm to 6:30 pm
Possible Detours: side streets. Businesses on Main Street affected (20,000 sq. ft.)

Geometric Design: Tangent section, 10 cross roads
Drainage: Install storm drains
Utilities: Relocate cable, install electrical for lighting
Economics: Approx. $500 K in user & non-user costs savings possible with aggressive accelerated construction schedule
Exercise F: Suburban/Rural Road Widening

Project Details:

Work
• Project length: 6 mi.
• Existing: 2” AC/8” Flex Base,
• FDR entire existing 24’ width
• Add 6’ Shldr. Widening
• Place 4” HMA surface
• Soil: Expansive clay

Traffic
AADT = 3,000 for main road with 20 driveways
Peak: M-F
  6:30 am to 9:00 am &
  4:30 pm to 6:30 pm

Possible Detours: Result in additional 5 mi.
Geometric Design: Adequate design, no major changes in horizontal & vertical alignment
Drainage: 1 box culvert & 5 pipe culverts need widening
Economics: Approx. $1M in user cost savings possible with aggressive accelerated construction schedule
Utilities: Not an issue
Items to Consider

- Key economic analysis factors
- ROW, utilities, environmental, historic preservation, archeology
- Public information
- Contracting methods
- Design
- Contractor selection
- Involvement of contractor
- Construction considerations
- Other
Suggested Time Utilization

- General project discussion – 15 min
- Items to consider – 15 min
- Top five challenges – 45 min
- Information needs – 15 min
Facilitator Report

• Briefly describe project

• Top 5 challenges

• Information needs
District Workshops on Accelerated Construction
Workshop Summary
AC-PP-17-14
Jon Epps

Abilene
MCM Elegante Suites
November 7, 2017
www.txdot.gov/business/resources/construction/regional-workshops.html
Peak-Period Congestion on NHS

Recurring Peak-Period Congestion

- Uncongested
- Congested
- Highly Congested
2017 Unified Transportation Program (UTP)

2017–2026
Transportation Planning & Programming
We Build Texas

Field Guide to
Successful Project Delivery

We build Texas – Safely
We build Texas – Quality
We build Texas – On Time
We build Texas – Together

Working together to successfully deliver projects.
Interest in Accelerated Construction

• Visibility to public
• Safety
• Economics
Acceleration Goals

Good

Construction time

20 to 0 %

reduction in time to complete project

Better

Construction time

50 to 20 %
Economic Consideration

• Direct project costs
  ▪ Agency
  ▪ Some contractor

• Indirect project costs (user/non-user)
  ▪ User fuel/time
  ▪ Roadside businesses
  ▪ Business efficiency (timely delivery)
  ▪ Some Contractor

All costs eventually borne by the public
# Project Delivery

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Letting

Construction

Time
Katy Freeway (IH-10)

- 23 miles
- 280,000 VPD
- $2.6 billion (2/3 construction)
- 6 years vs 12 years
Economic Incentives - Contractor

• One job/occasional job
• Return on investment (equipment)
• Bonding capacity
• Backlog of work
• Risk
Policies and Procedures

• Develop guidelines
• District support team
  ▪ Bridges
  ▪ Pavements
  ▪ Construction planning
  ▪ Drainage
  ▪ Traffic
  ▪ Production rates
Involvement of Contractor

- Planning and design review
- Partnering
- Communication
- Workforce
Development Needs

- Project selection
- Contracting methods
- Design guides
- Contractor selection
- Involvement of contractor
- Construction considerations
Development Needs

• Evaluation tools to allow use of existing materials
  ▪ Condition of existing material
  ▪ Recycling
• Traffic modeling
• Economic analysis
• Rapid QC/QA
• Removal & replacement of materials
• Equipment development
• Materials development
Not All Projects Are Suitable for Accelerated Construction
District Workshops on Accelerated Construction

www.txdot.gov/business/resources/construction/regional-workshops.html
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