# Agenda

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
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<td>Brianne Glover – TTI</td>
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<td>Michael Bostic – TxDOT, CST</td>
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<td><strong>Accelerated Bridge Construction</strong></td>
<td>Steven Austin – TxDOT, BRG</td>
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<td></td>
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<td>Chris Reed – TxDOT, CHS</td>
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<td>Ed Goebel – TxDOT, LBB</td>
</tr>
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<td><strong>Public Information</strong></td>
<td>Sonja Gross – TxDOT, CMD (AMA)</td>
</tr>
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<td>• B-Pavement Widening</td>
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<tr>
<td></td>
<td>• C-Rural Intersection Reconstruction</td>
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</tr>
<tr>
<td></td>
<td>• D-Bridge Widening</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• E-Small Town Main Street</td>
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<tr>
<td></td>
<td>• F-Suburban/Rural Road Widening</td>
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<tr>
<td></td>
<td>Moderator:</td>
<td></td>
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<tr>
<td></td>
<td>• A- Aldo Madrid – TxDOT, ELP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• B- Breakout Omitted</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• C- Daniel Cruz – TxDOT, LBB</td>
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<tr>
<td></td>
<td>• D- Wes Kimmell – TxDOT, AMA</td>
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<tr>
<td></td>
<td>• E- Corky Neukam – TxDOT, AMA</td>
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<tr>
<td></td>
<td>• F- Chuck Steed – TxDOT, CHS</td>
<td></td>
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<td>Jon Epps – TTI</td>
</tr>
</tbody>
</table>
# District’s Workshop on Accelerated Construction

**Location:** Lubbock, MCM Elegante Hotel and Suites

**Date:** November 8, 2017

<table>
<thead>
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<td>Project Selection Based on Economics</td>
<td>Briane Glover – TTI, Division Head, Infrastructure Investment Analysis</td>
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<td>10:40-11:00</td>
<td>Accelerated Bridge Construction in Texas</td>
<td>Steven Austin – TxDOT, Bridge Division, Chris Reed – TxDOT, Director of Construction, LBB</td>
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<td>11:00-11:20</td>
<td>Design Considerations with Examples of Past Success</td>
<td>Ed Goebel-TxDOT, Director of Construction, LBB</td>
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<td>Traffic and Safety</td>
<td>Frank Guzman-TxDOT, West El Paso AE, ELP</td>
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<td>11:30-11:40</td>
<td>Public Information</td>
<td>Sonja Gross-TxDOT, Public Information Officer, AMA</td>
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<td>11:40-12:00</td>
<td>Accelerated Construction Concepts</td>
<td>Michael Oliver, Webber LLC.</td>
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<td>Matt Herbstritt – TxDOT, Childress Asst. AE, CHS</td>
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<td>Daniel Cruz-TxDOT, Laboratory Supervisor, LBB</td>
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<td>Reconstruction</td>
<td>Francisco Marez-TxDOT, East El Paso Asst., ELP</td>
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<td>• D-Widening Bridge</td>
<td>Wes Kimmell-TxDOT, Pampa AE, AMA</td>
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<td>Jorge Oregel-TxDOT, West El Paso Asst. AE, ELP</td>
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<td>• E-Small Town Intersection</td>
<td>Corky Neukam-TxDOT, Dumas AE, AMA</td>
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<td>Topic Facilitators</td>
<td>Dominique Lorng-TxDOT, Design Tech III, LBB</td>
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<td>• F-Suburban/Rural Widening</td>
<td>Chuck Steed-TxDOT, Director of TP&amp;D, CHS</td>
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<td>Topic Facilitators</td>
<td>Falon Renfroe-TxDOT, Engineering Asst. III, AMA or Eric Rodriguez-TxDOT, Design Tech III</td>
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<tr>
<td>2:30-3:15</td>
<td>Report from Breakout Groups &amp; Discussion</td>
<td>David Newcomb - TTI, Division Head, Materials and Pavements</td>
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District Workshops on Accelerated Construction

Welcome

AC-PP-17-01

Jon Epps

Lubbock
MCM Elegante Hotel and Suites
November 8, 2017

www.txdot.gov/business/resources/constructionREGIONAL-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

## Planning & Programming
- Need
- Scope
- Cost estimate
- Authorization
- Planning
- Funding

## Preliminary Design
- Design Concept
- Data Collection
- Public meetings
- Schematics
- Preliminary
- Geometric
- Value Engineering

## Environmental
- Preliminary
- Interagency
- Documentation
- Public hearing
- Clearances

## ROW Utilities
- Data Collection
- ROW map
- Appraisals
- Acquisition
- Utility adjustment

## PS&E
- Design details
- Final alignment & profiles
- Roadway
- Operational
- Bridge
- Drainage
- Misc structures
- Traffic control
- Review

---

**Time**

- Letting
- Construction

---

*Texas A&M Transportation Institute*
Acceleration Goals

**Good**

20 to 0%

Construction time

**Better**

50 to 20%

Construction time

reduction in time to complete project
Not All Projects Are Suitable for Accelerated Construction
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</table>
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

**Project Level Economic Screening Tool**

**AC-IR-17-03**

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

• Information sharing

• Existing TxDOT “tools”

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

TxDOT  Industry

Texas A&M Transportation Institute
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

Lubbock
MCM Elegante Hotel and Suites
November 8, 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

### Increasing Demand (1980-2000)

<table>
<thead>
<tr>
<th>Metric</th>
<th>Increase</th>
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<tbody>
<tr>
<td>Vehicles Miles</td>
<td>+80%</td>
</tr>
<tr>
<td>Drivers</td>
<td>+31%</td>
</tr>
<tr>
<td>Lane Miles</td>
<td>+3.8%</td>
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</tbody>
</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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<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>
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<tr>
<td>• Corridor Improvement</td>
<td>• Training</td>
<td>• Constructability</td>
</tr>
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</table>

• Worker Health & Safety
Recurring Peak-Period Congestion

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

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

Cost vs. Days Graph:
- Points E, F, G, H, I, J, K, L
- Axes: 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
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
• 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

Lubbock
MCM Elegante Hotel and Suites
November 8, 2017
Outline

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

### Planning & Programming
- Need
- Scope
- Cost estimate
- Authorization
- Planning
- Funding

### Preliminary Design
- Design Concept
  - Data Collection
  - Public meetings
  - Schematics
  - Preliminary
  - Geometric
  - Value Engineering

### Environmental
- Preliminary
  - Interagency
  - Documentation
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### ROW Utilities
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  - Drainage
  - Misc structures
  - Traffic control
  - Review

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**Time**

- Letting
- Construction

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[Texas A&M Transportation Institute]
## Economic Considerations - Examples

<table>
<thead>
<tr>
<th>Project</th>
<th>Per Month Costs</th>
<th>Project Costs</th>
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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>
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<tr>
<td>Widen Freeway (2.6 miles)</td>
<td>$297,000</td>
<td>$17.8M</td>
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<tr>
<td>Interchange in urban area (1.5 miles)</td>
<td>$447,000</td>
<td>$5.1M</td>
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</tbody>
</table>
Acceleration Goals

Good

construction time

reduction in time to complete project

Better
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
Population 2050

- 1 - 50,000
- 50,000 – 250,000
- 250,000 – 1,000,000
- 1,000,000 – 1,500,000
- Over 1,500,000
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.
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
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

Best Practices in Accelerated Construction Techniques
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
• Texas Landscape
• Texas History
• Opportunities

• Workshop Outcomes
Workshop Goals

• Information sharing

• Existing TxDOT “tools”

• Identify needed “tools” & “policies”
Not All Projects Are Suitable for Accelerated Construction
District Workshops on
Accelerated Construction

Lubbock
MCM Elegante Hotel and Suites
November 8, 2017
District Workshops on Accelerated Construction

Economic Screening Tools

AC-PP-17-04

David Ellis
Brianne Glover

Lubbock
MCM Elegante Hotel and Suites
November 8, 2017
Project Level Economic Screening Tool

• Benefit-Cost tool

• Focus – road user costs and economic losses

Economic Impact
Project Level Economic Screening Tool

Inputs

- Traffic Data
- Geographic Location
- Cost to Accelerate Construction
- Project Timing
- Construction Segments
- Adjacent Retail Businesses

Number of Construction Days
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>
</tr>
<tr>
<td>Project Region</td>
<td>Urban</td>
</tr>
<tr>
<td>Retail (SQFT)</td>
<td>2,000,000</td>
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<tr>
<td>Travel Time per Trip (minutes)</td>
<td>7.2</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Traditional Construction Scenario</th>
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# Project Level Economic Screening Tool

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<th>Accelerated Construction Parameters</th>
<th>Values</th>
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<tbody>
<tr>
<td>Days</td>
<td></td>
<td>450</td>
<td>Days</td>
<td>180</td>
</tr>
<tr>
<td>Segment Length</td>
<td></td>
<td>3</td>
<td>Segment Length</td>
<td>3</td>
</tr>
<tr>
<td>Average Operating Speed (Peak)</td>
<td></td>
<td>10</td>
<td>Average Operating Speed (Peak)</td>
<td>10</td>
</tr>
<tr>
<td>Average Operating Speed (Off-Peak)</td>
<td></td>
<td>45</td>
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<td>45</td>
</tr>
<tr>
<td>Percent of Traffic Diverted</td>
<td></td>
<td>20%</td>
<td>Percent of Traffic Diverted</td>
<td>20%</td>
</tr>
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</table>

| Segment 2:                      |                                     |        |                                    |        |
| Days                            |                                     | 450    | Days                                | 185    |
| Segment Length                  |                                     | 3      | Segment Length                      | 3      |
| Average Operating Speed (Peak)  |                                     | 10     | Average Operating Speed (Peak)      | 10     |
| Average Operating Speed (Off-Peak) |                                 | 45     | Average Operating Speed (Off-Peak)  | 45     |
| Percent of Traffic Diverted     |                                     | 20%    | Percent of Traffic Diverted         | 20%    |

| Segment 3:                      |                                     |        |                                    |        |
| Days                            |                                     |        | Days                                |        |
| Segment Length                  |                                     |        | Segment Length                      |        |
| Average Operating Speed (Peak)  |                                     |        | Average Operating Speed (Peak)      |        |
| Average Operating Speed (Off-Peak) |                                 |        | Average Operating Speed (Off-Peak)  |        |
| Percent of Traffic Diverted     |                                     |        | Percent of Traffic Diverted         |        |

| Segment 4:                      |                                     |        |                                    |        |
| Days                            |                                     |        | Days                                |        |
| Segment Length                  |                                     |        | Segment Length                      |        |
| Average Operating Speed (Peak)  |                                     |        | Average Operating Speed (Peak)      |        |
| Average Operating Speed (Off-Peak) |                                 |        | Average Operating Speed (Off-Peak)  |        |
| Percent of Traffic Diverted     |                                     |        | Percent of Traffic Diverted         |        |

*Texas Transportation Institute*
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Project Level Economic Screening Tool

Economic Loss

- Sales
- State Sales Tax Revenue
- Local Sales Tax Revenue
## Results

<table>
<thead>
<tr>
<th>Traditional Construction Tools</th>
<th>Values</th>
</tr>
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<tbody>
<tr>
<td>Total Road User Costs and Economic Loss</td>
<td>$1,832,284,439</td>
</tr>
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<table>
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<th>Accelerated Construction Tools</th>
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<td>Total Road User Costs and Economic Loss</td>
<td>$771,059,803</td>
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<table>
<thead>
<tr>
<th>Traditional vs Accelerated</th>
<th>Values</th>
</tr>
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<tbody>
<tr>
<td>Change in Road User Costs and Economic Loss</td>
<td>$1,061,224,636</td>
</tr>
<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>
</tr>
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</table>
Estimated User Costs and Economic Losses

- Travel Time Value
- Operating Costs
- Loss of Sales
- Loss of Tax Revenue
- Cost to Accelerate

Traditional: $1,832,284,439
- Travel Time Value: $1,200,000,000
- Operating Costs: $400,000,000
- Loss of Sales: $200,000,000
- Loss of Tax Revenue: $232,284,439
- Cost to Accelerate: $400,000,000

Accelerated: $771,059,803
- Travel Time Value: $500,000,000
- Operating Costs: $200,000,000
- Loss of Sales: $100,000,000
- Loss of Tax Revenue: $559,059,803
- Cost to Accelerate: $400,000,000
District Workshops on Accelerated Construction

Contacts
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b-glover@tamu.edu  

David Ellis  
d-ellis@tamu.edu

Lubbock  
MCM Elegante Hotel and Suites  
November 8, 2017
District Workshops on Accelerated Construction Project Development
AC-PP-17-05
Michael Bostic

Lubbock
MCM Elegante Hotel and Suites
November 8, 2017
OUTLINE

• Project Selection and Planning
• Contracting Methods
• Design
• Contractor Selection
• Involvement of Contractor
• Construction Considerations
TxDOT RESOURCES

- 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
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
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
Contracting Methods

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
DESIGN

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
Partnering

• 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 insure 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
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

Lubbock
MCM Elegante Hotel and Suites
November 8, 2017
ACCELERATED BRIDGE CONSTRUCTION IN TEXAS (AND BEYOND)

Steven Austin, P.E.
TxDOT Bridge Division
### Accelerated Bridge Construction (ABC) Techniques

<table>
<thead>
<tr>
<th></th>
<th>Technique</th>
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<tbody>
<tr>
<td>1</td>
<td>Prefabricated Elements</td>
</tr>
<tr>
<td>2</td>
<td>Self Propelled Modular Transporters (SPMTS)</td>
</tr>
<tr>
<td>3</td>
<td>Modular Units</td>
</tr>
<tr>
<td>4</td>
<td>Lateral Slide-in Bridge Construction</td>
</tr>
</tbody>
</table>

*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 Columns
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: 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)
Full Width, Full Depth Panels – FM 413 (WAC)

SECTION B-B

- Steel components installed at site (TYP)
- TWI slotted barrier (TYP)
- Nominal face of TWI rail
- G girder 1 and blockouts
- G girder 2 and blockouts
- G girder 3 and blockouts
- G girder 4 and blockouts
- TWI between blockouts
- Concrete curb with anchor bolt precasted with deck (TYP)
- See TWI for info not shown.
Self Propelled Modular Transporters (SPMT)

Photos Courtesy of Heavy Equipment Guide
Modular Units
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
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 (Roll-In Method)
ACCELERATED CONSTRUCTION PRACTICES IN DESIGN

Planning for Success
DESIGN STRATEGIES
“Perhaps the history of the errors of mankind, all things considered, is more valuable and interesting than that of their discoveries.”
“Give me six hours to cop down a tree and I will spend the first four sharpening the axe”
Design Strategies to Accelerate Construction

- Keep up with errors that happen in the field and make sure they are covered in the subsequent projects.
- A+B Bidding
- Milestones
- Pick the appropriate time charges.
- Incentives and Disincentives
Design Strategies to Accelerate Construction

- Use the appropriate bid items.
- Make sure there are pay items to pay the contractor for the work being done. Try not to make everything subsidiary.
- Plainly spell out what you want and put the detail in the plans.
- Ask Maintenance how they would do it.
- Be open to contractor suggestions after the project is let.
  - Can we close the road?
Design Strategies to Accelerate Construction

- Step outside the box.
- Schedule the project appropriately.
- Get your designers out into the field. Use this time to construct the project in your head.
- Know your local contracting community and know their strengths and limitations.
Design Strategies to Accelerate Construction

- **KEEP YOUR EGO AT HOME!!!!**
  - Ask for suggestions.
  - Reach out to others in the industry for ideas.
GETTING INTO THE DETAILS
Getting into the Details

- Keep up with errors that happen in the field and make sure they are covered in the subsequent projects.
  - Assign a person to ensure this happens. Hold them accountable.
  - Meetings are nice, but is there a more effective way?
  - Keep a checklist of COs and make sure they are caught in Design.
  - Hold design review meetings.
  - Use this to teach your young designers.
Getting into the Details

- Incentives and Disincentives
  - Focus more on Incentives.
  - Need help with Road User Costs get with TTU and their IAC
- Use the appropriate bid items.
  - Know your area and know your limitations.
  - Use items that allow more flexibility in the field.
    - For header material for the bridge joints. Use CF instead of LF. This makes sure the contractor gets paid for the work he does.
    - This cuts down on the arguments in the field.
Getting into the Details

- Step outside the box.
  - Don’t always revert to what is “normally” done.
  - In playa lake areas think about using a coffer dam to keep the water out of the work area instead of waiting for the water to subside.
  - Use materials that have a quick set time and do not need to cure very long, Even if it is more expensive.
Getting into the Details

- Schedule the project appropriately.
  - Bad Schedule.

<table>
<thead>
<tr>
<th>ID</th>
<th>Task Name</th>
<th>Duration</th>
<th>Start</th>
<th>Finish</th>
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<tr>
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<td>Erik Smith - From Texas Tech Pkwy to Indian Ave</td>
<td>23 days</td>
<td>Tue 2/1/18</td>
<td>Thu 2/1/18</td>
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<td>2</td>
<td>Mobilization</td>
<td>1 day</td>
<td>Tue 2/1/18</td>
<td>Thu 2/1/18</td>
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<tr>
<td>3</td>
<td>Install advance warning signs</td>
<td>1 day</td>
<td>Wed 2/1/18</td>
<td>Thu 2/1/18</td>
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<tr>
<td>4</td>
<td>Prop R/W, remove existing pavement markings and place 1 day work zone</td>
<td>30 days</td>
<td>Thu 2/1/18</td>
<td>Thu 2/1/18</td>
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<td>5</td>
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<td></td>
<td>Fri 2/1/18</td>
<td>Thu 2/1/18</td>
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<tr>
<td>6</td>
<td>Prep R/W, remove existing pavement markings and place 3 days work zone</td>
<td>2 days</td>
<td>Fri 2/1/18</td>
<td>Mon 2/1/18</td>
</tr>
<tr>
<td></td>
<td>and channelizing devices</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Install advance warning signs</td>
<td>2 days</td>
<td>Fri 2/1/18</td>
<td>Mon 2/1/18</td>
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<tr>
<td>8</td>
<td>Prep R/W, remove existing pavement markings and place 3 days work zone</td>
<td>2 days</td>
<td>Fri 2/1/18</td>
<td>Mon 2/1/18</td>
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<td>43 days</td>
<td>Wed 2/1/18</td>
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<td>10</td>
<td>Install advance warning signs</td>
<td>2 days</td>
<td>Wed 2/1/18</td>
<td>Fri 2/1/18</td>
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<tr>
<td>11</td>
<td>Prep R/W, remove existing pavement markings and place 3 days work zone</td>
<td>2 days</td>
<td>Wed 2/1/18</td>
<td>Fri 2/1/18</td>
</tr>
<tr>
<td></td>
<td>and channelizing devices</td>
<td></td>
<td></td>
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<td>12</td>
<td>Construct proposed pavement and intersections</td>
<td>27 days</td>
<td>Mon 2/1/18</td>
<td>Fri 2/1/18</td>
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<td>13</td>
<td>Place permanent pavement marking (TY II only)</td>
<td>1 day</td>
<td>Wed 2/1/18</td>
<td>Fri 2/1/18</td>
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<tr>
<td>14</td>
<td>Place final signing and final TY I (thermo) markings</td>
<td>2 days</td>
<td>Thu 2/1/18</td>
<td>Fri 2/1/18</td>
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<td>15</td>
<td>Install permanent seeding</td>
<td>1 day</td>
<td>Thu 2/1/18</td>
<td>Fri 2/1/18</td>
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<td>16</td>
<td>Remove advance and work zone markings and channelizing devices.</td>
<td>5 days</td>
<td>Thu 2/1/18</td>
<td>Fri 2/1/18</td>
</tr>
<tr>
<td>17</td>
<td>Final project clean-up</td>
<td>2 days</td>
<td>Fri 2/1/18</td>
<td>Fri 2/1/18</td>
</tr>
</tbody>
</table>

**Project: Project 2015 Construction 5th**
**Date: Thu 2/1/18**
Schedule the project appropriately.

- Good Schedule.
Know your local contracting community and know their strengths and limitations.

- How many Hot mix plants do they have?
- How many crews do they have?
- Can they do concrete in house or do they normally sub it out?
- Are there finish blade men in the area?
- Contractors: Understand that letting dates are some times out of our hands and this will affect how quickly the works gets done.
Conclusion

- If we learn from the past we can plan better for the future.
- Get to know your local contractors and use their knowledge in design.
- Project management should not be an afterthought, plan for it during design.
- Use appropriate bid items.
- Schedule the project correctly.
- Use incentives more than disincentives.
- Step out side the box.
- Remember our customers who use the roads are who we design and plan for. Keep in mind how do we get out of their way as soon as possible.
“Planning is bringing the future into the present so that you can do something about it now.”

Alan Lakein
QUESTIONS?
My gift to you
ACCELERATED CONSTRUCTION: COMMUNICATION OPPORTUNITIES

Sonja Gross, PIO, Amarillo District

November 8, 2017
Recent Accelerated Construction in AMA District

- **Bushland Bridge**
  - Damaged in late February after a semi-truck veered off Interstate 40 and struck the westbound bridge.
  - Initially planned to repair, but a cost/benefit analysis determined that reconstruction was more feasible.
  - Resulted in project starting later than what was initially communicated to this rural community.
  - It is the only thoroughfare that connects the Bushland community, which is divided by the interstate, with schools on each side.
  - Greatly impacted the community because RM 2381 (Bushland Road) crosses under I-40 and had to be completely closed through the duration of the accelerated construction project.
  - Constant and consistent communication with the community, particularly the school system, was crucial in this accelerated project being met favorably by the community.
Bushland Bridge
Recent Accelerated Construction in AMA District

- **Bell Street Bridge**
  - This accelerated construction project presented a unique set of communication opportunities because:
    - Bridge was closed in both directions for duration of project
    - Bridge serves as major connector for high school, hospital, hotel and other general business traffic
  - During demolition of the bridges, traffic was moved off the interstate and onto the frontage roads
    - Although alternate routes were communicated often and in advance of demolition, I-40 serves is a major artery for semi-truck traffic
Bell Street Bridge

TXDOT Amarillo @TxDOTAmarillo · Jul 28
At 7 tonight, we start closing I-40 at Bell Street in both directions for demolition of EB turnaround bridge. Slow down, follow detours.

Bell Street Bridge Replacement (at I-40)
- I-40 speed limit through construction zone is 50 mph.
- I-40 frontage roads and Bell Street Speed limits are 35 mph.
- Once this weekend’s (7/28 – 7/30) demolition of the eastbound turnaround bridge is complete, the Bell Street bridge will reopen for the workweek (7/31 – 8/4) and traffic will be put back on I-40 beginning Monday morning (7/31).
- Once I-40 reopens to traffic on the morning of Monday, July 31, the right lane and shoulders will be closed in both directions.
- The right northbound lane on Bell Street will be closed.
- On Friday, Aug. 4, demolition of the main Bell Street bridge will begin at 9 p.m.
- When the Bell Street bridge closes at 9 p.m. on Friday, Aug. 4, it will remain closed through completion of the project.
- I-40 will close in both directions through the work zone at Bell Street beginning with lane closures at 7 p.m. on Friday, Aug. 4 followed by full closure of the Interstate at 9 p.m.
- I-40 will remain closed at Bell Street all weekend from 9 p.m. Friday, Aug. 4 until 6 a.m. Monday, Aug. 7.
Stakeholders – Building Trust

- Who are your stakeholders?
  - Understand, appreciate and consider community and stakeholder values and needs
  - Strive to incorporate or address stakeholder values in the evolution of the project

- Be responsive and consistent when distributing information and when establishing and building community trust

- Be a good neighbor during disruptive construction
  - Develop outreach correspondence and detour maps for distribution to stakeholders that will be impacted during construction
Communications Toolbox

- TxDOT’s Public Information Officer is your #1 tool!

- Community Outreach (as warranted)
  - Presentations to local community groups
  - Newsletters and project trackers
  - Town Hall meetings/Open Houses
  - One-on-One meetings with adjacent and affected businesses

- Media Partners
  - Provide regular and transparent updates
  - Offer live shot opportunities with work progressing in background
  - Morning shows – radio and television
  - Take media on tours of projects
Communications Toolbox

- **Traditional Tools**
  - Press Releases
    - Weekly e-blasts with up-to-date lane closure information (subscribers)

  **AMARILLO AREA LANE CLOSURE REPORT**
  **Week of Nov. 6, 2017**

  - Expect daily weekday lane closures on Amarillo Boulevard at Taylor Street, Fillmore Street, Pierce Street, and Buchanann Street for the installation of new traffic signals.
  - Expect various lane closures on I-40 eastbound just before Coulter Street to Western Street as crews perform needed roadway repairs and maintenance. This work has an anticipated completion date of Nov. 15, 2017.
  - Various lanes of Interstate 40 westbound will be from the Carson County line to Eastern Street for fog seal operations.
  - Various lanes of Interstate 27 will be closed in both directions at McCormick Road for patching repairs.
  - The right lane of I-40 eastbound will be closed from Adkisson Road to Arnot Road for patching repairs.
  - Various lanes of the I-27 northbound frontage road will be closed at Rockwell Road for seal coat operations.

- Social Media
- Project websites
- Maps, fliers
- Digital Messaging Signs
Outreach Techniques

- Communicate traffic impacts early and often
  - Media and general public

- Develop and provide easy to understand detour maps

- Coordinate with on-road traffic management systems – dynamic messaging system

- Coordinate with emergency and traffic management services
  - Police, fire, ambulance, school fleet services

- Coordinate with sister agencies – transit and regional mobility authorities
  - In Bushland, it was imperative that we regularly communicated with the school system’s fleet superintendent because not only did closure of the RM road impact the bus route, it also impacted his budget
  - On Bell Street in Amarillo, taxis and other transit services that served the medical community relied on accurate, up-to-date information
Lessons Learned

- While it is important for TxDOT to communicate with the public, it is equally, if not more, important for TxDOT and its contractor to communicate with one another – and well before activity takes place.

- Why do you think this is important?

*** PIO is your #1 tool in helping keep traffic flowing as smoothly and friendly as possible! ***
I just wanted to write you both to express my gratitude for the work you have performed on the overpass reconstruction project at Bushland Road and I-40 ... I have to admit, I was skeptical about the timeline for the project when it was initially submitted; I did not think you gave yourself enough time to complete the job as presented ... I was wrong. Your crew worked early mornings before the sun came up and late into the evenings. I am impressed. To open up the underpass approximately two weeks early is unprecedented (at least in my dealings with construction crews). On behalf of the Bushland ISD staff and the community, I want to THANK YOU for making this job a priority and allowing us to get back to normal, if there is such a thing.

Again, Thank You for a job well done!

Don Wood
Bushland ISD Superintendent
Sonja Gross
Public Information Officer
TxDOT, Amarillo District
(806) 356-3256
sonja.gross@txdot.gov
Welcome to Webber
WEBBER OVERVIEW
HIGHLIGHTS

2015
Revenues (2015) million
704
Employees
1579
Backlog billion
1.074

2016
Revenues (2016) million
781
Employees
2000
Backlog billion
1.177

2017
Revenues (2017) million
889
Employees
2100
Backlog billion
1.4
WEISS OVERVIEW
BUSINESS GROUPS

HEAVY CIVIL
- Highways + Bridges
- Railroads + Transit
- Ports + Marine
- Airports

44 projects under construction
$1.8B in contracts

WATERWORKS
- Treatment Plants
- Purification Plants
- Pump Stations
- Desalination

35 projects under construction

COMMERCIAL
- Higher Education + K12
- Hospitality + Multi-Family
- Retail
- Office

14 projects under construction

MATERIALS
- Sand Mining
- Recycle-Milling
- Demolition

4.7M total tons of material in 2016
Webber Overview

Presence

Regional Offices
- Houston (STX)
- Dallas (NTX)
- New Braunfels (CTX)

Headquarters
- The Woodlands
For more than 50 years, Webber has established itself as one of the largest transportation constructors in Texas. With about 2,100 employees and a global network of resources, Webber has the expertise to make any heavy civil project successful from start to finish using value engineering, superior scheduling, the latest technology and proven field experience.

### Highways + Bridges
- US 290 (Segments 5, 6, 7)
- Tomball Tollway
- I45 Walker County
- US 281 Bexar County
- SH 114- Signature Bridge
- Grand Parkway

### Railroads + Transit
- UPRR
- BNSF

### Ports + Marine
- Port of Galveston Cruise Terminal Expansion
- Pier 16 & 18

### Airports
- Lone Star Airport
- Hobby Airport
- Bush International
- Tyler Airport
TXDOT
ACCELERATED CONSTRUCTION WORKSHOP

Lubbock, Texas
“Individual Commitment to a Group effort—that is what makes a team work, a company work, a society work, a civilization work”

Vince Lombardi
Design Phase

Decisions here have long term consequences

• Design the project that needs to be built
• Unanswered questions at bid time =$$$$
• Constructability reviews
Preplanning is Key

- Contractor + Owner/Engineer = SUCCESS
- Contractor must identify issues early and provide possible solutions
- TXDOT must provide answers as quickly as possible
Construction Period

Work everywhere you can

• Rephase the project
There’s a misconception about teamwork. Teamwork is the ability to have different thoughts about things; it’s the ability to argue and stand up and say loud and strong what you feel. But in the end, it’s about the ability to adjust to what is best for the team.”

Tom Landry
THANK YOU
District Workshops on Accelerated Construction
Regional Workshop Exercises
AC-PP-17-11
David Newcomb

Lubbock
MCM Elegante Hotel and Suites
November 8, 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
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<tr>
<td>A-Pavement Strengthening</td>
<td>Sergio Garcia - TxDOT, District Laboratory, ELP</td>
<td>Matt Herbstritt – TxDOT, Childress Asst. AE, CHS</td>
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<tr>
<td>Tumbleweed A</td>
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<tr>
<td>Pavement Widening</td>
<td>Steve Warren – TxDOT District Engineer, LUB</td>
<td>Falon Renfroe-TxDOT, Engineering Asst. III, AMA</td>
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<td>C-Rural Intersection</td>
<td>Daniel Cruz-TxDOT, Laboratory Supervisor, LBB</td>
<td>Francisco Marez-TxDOT, East El Paso Asst., ELP</td>
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<td>Bluebonnet B</td>
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<td>D-Widening Bridge</td>
<td>Wes Kimmell-TxDOT, Pampa AE, AMA</td>
<td>Jonathon Concha-TxDOT, West El Paso Asst. AE, ELP</td>
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<td>Caprock C</td>
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<td>E-Small Town Intersection</td>
<td>Corky Neukam-TxDOT, Dumas AE, AMA</td>
<td>Dominique Lorng-TxDOT, Design Tech III, LBB</td>
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<td>F-Suburban/Rural Widening</td>
<td>Chuck Steed-TxDOT, Director of TP&amp;D, CHS</td>
<td>Eric Rodrequez-TxDOT, Design Tech III</td>
</tr>
<tr>
<td>Cotton</td>
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</table>
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

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
  - 6’ Shldr. Widening
  - 2” Overlay
- Soil: Expansive clay

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

Lubbock
MCM Elegante Hotel and Suites
November 8, 2017
### Exercise A: Pavement Strengthening

<table>
<thead>
<tr>
<th>10’ shldr</th>
<th>12’ lane</th>
<th>12’ lane</th>
<th>4’ shldr</th>
</tr>
</thead>
<tbody>
<tr>
<td>4’ shldr</td>
<td>12’ lane</td>
<td>12’ lane</td>
<td>10’ shldr</td>
</tr>
</tbody>
</table>

#### 30’ Median

---

### 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
## 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 B: Pavement Widening

**New Lane Limits**
- 10’ shldr
- 12’ lane
- 12’ lane
- 4’ shldr
- 40’ Median
- 4’ shldr
- 12’ lane
- 12’ lane
- 10’ shldr

**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
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
Exercise E: Small Town Main Street

**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
District Workshops on Accelerated Construction

Workshop Summary

AC-PP-17-14

Jon Epps

Lubbock

MCM Elegante Hotel and Suites

November 8, 2017

www.txdot.gov/business/resources/construction/regional-workshops.html
Recurring Peak-Period Congestion

- Uncongested
- Congested
- Highly Congestated
Unified Transportation Plan

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**

Reduction in time to complete project

**Better**

Reduction in time to complete project
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

<table>
<thead>
<tr>
<th>Planning &amp; Programming</th>
<th>Preliminary Design</th>
<th>Environmental</th>
<th>ROW Utilities</th>
<th>PS&amp;E</th>
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<tbody>
<tr>
<td>• Need</td>
<td>Design Concept</td>
<td>• Preliminary</td>
<td>• Data Collection</td>
<td>• Design details</td>
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<tr>
<td>• Scope</td>
<td>• Data Collection</td>
<td>• Interagency</td>
<td>• ROW map</td>
<td>• Final alignment &amp; profiles</td>
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<tr>
<td>• Cost estimate</td>
<td>• Public meetings</td>
<td>• Documentation</td>
<td>• Appraisals</td>
<td>• Roadway</td>
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<tr>
<td>• Authorization</td>
<td>• Schematics</td>
<td>• Public hearing</td>
<td>• Acquisition</td>
<td>• Operational</td>
</tr>
<tr>
<td>• Planning</td>
<td>• Preliminary</td>
<td>• Clearances</td>
<td>• Utility adjustment</td>
<td>• Bridge</td>
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<tr>
<td>• Funding</td>
<td>• Geometric</td>
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<td>• Drainage</td>
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<td>• Value Engineering</td>
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<td>• Misc structures</td>
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<td>• Traffic control</td>
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<td>• Review</td>
</tr>
</tbody>
</table>

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**Time**

- Letting
- Construction
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
CAUTION
Not All Projects Are Suitable for Accelerated Construction
District Workshops on Accelerated Construction

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