



Abilene/Brownwood/Odessa/San Angelo/Wichita Falls
District Workshop on Accelerated Construction
November 7, 2017
MCM Elegante Suites Abilene

Agenda

Time	Topic	Facilitator
8:00-8:30	Registration	
8:30-8:45	Welcome	Jon Epps - TTI
8:45-9:00	History of Accelerated Construction	David Newcomb - TTI
9:00-9:30	TxDOT's Interest	Randy Hopmann - TxDOT, ADM
9:30-9:50	Project Selection Economics	Brianne Glover - TTI
9:50-10:10	Break	
10:10-10:40	Project Development	Michael Bostic - TxDOT, CST
10:40-11:00	Accelerated Bridge Construction	Steven Austin - TxDOT, BRG Dan Richardson, TxDOT, ABL
11:00-11:20	Design Considerations	Chris Graf - TxDOT, BWD
11:20-11:30	Traffic/Safety	Paul Norman - TxDOT, ABL
11:30-11:40	Public Information	Karen Threlkeld - TxDOT, CMD (SJT)
11:40-12:00	Construction	Kenneth Ford - Jones Brothers Dirt and Paving Construction, Inc.
12:00-12:45	Lunch	
12:45-1:00	Charge to Breakout Groups <ul style="list-style-type: none"> • A-Pavement Strengthening • B-Pavement Widening • C-Rural Intersection Reconstruction • D-Bridge Widening • E-Small Town Main Street • F-Suburban/Rural Road Widening 	David Newcomb - TTI <i>Moderators:</i> 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 <i>Recorders:</i> 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
1:00-2:30	Group Discussion of Example Problems	Group Moderators/Recorders - TxDOT
2:30-3:15	Reports from Groups	David Newcomb - TTI
3:15-3:30	Break	
3:30-3:45	Contractor's View of the Future	Kenneth Ford - Jones Brothers Dirt and Paving Construction, Inc.
3:45-4:15	TxDOT's View of the Future	Randy Hopmann - TxDOT, ADM
4:15-4:30	Summary/Adjourn	Jon Epps - TTI

District Workshops on Accelerated Construction

Welcome
AC-PP-17-01
Jon Epps

Abilene

MCM Elegante Suites

November 7, 2017



*Texas
Department
of Transportation*



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



<http://www.txdot.gov/business/resources/construction/regional-workshops.html>

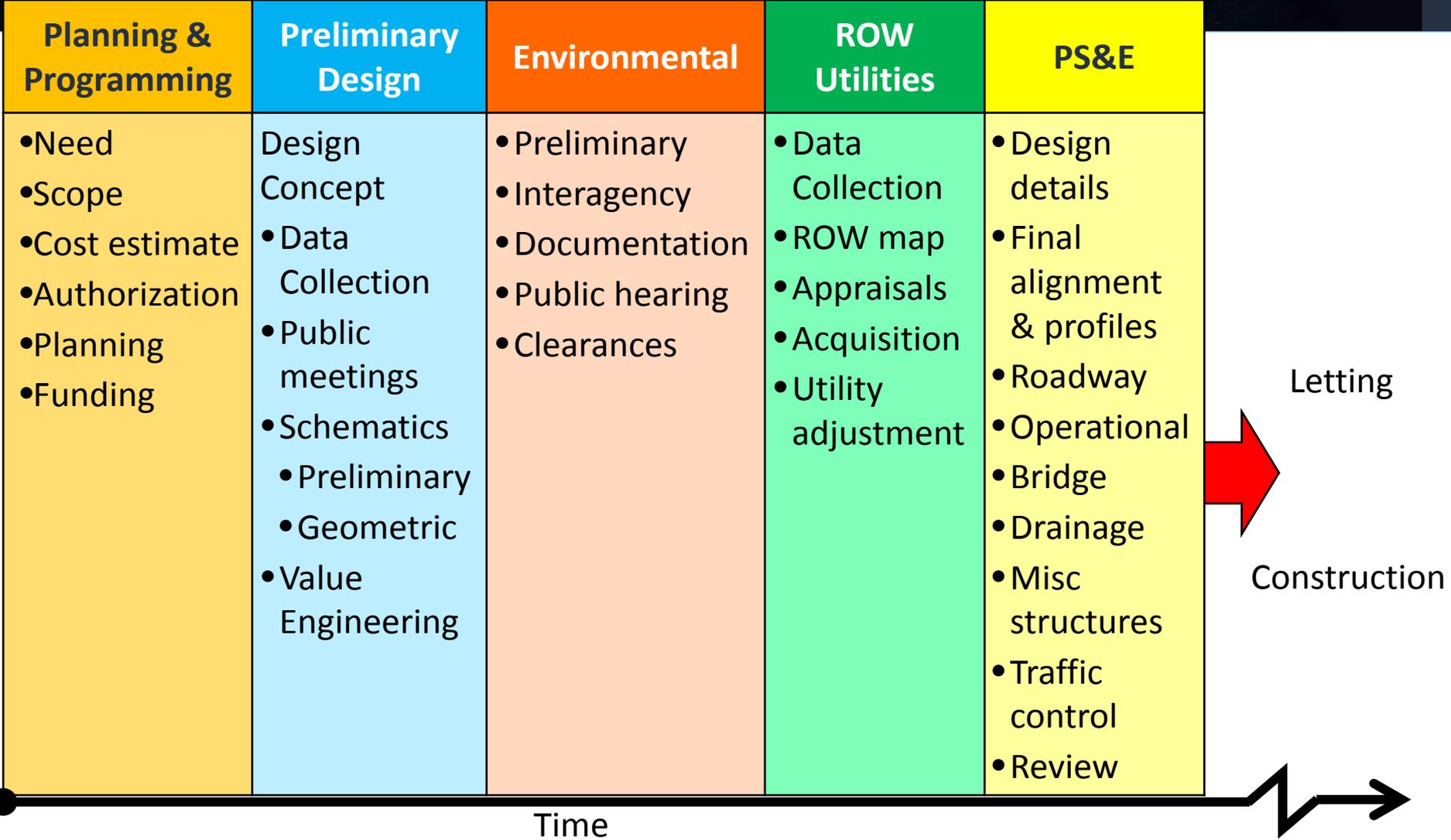
Definition of Construction

Greenfield

- Capacity improvement
- Reconstruction
- Rehabilitation
- Major maintenance
- Minor maintenance



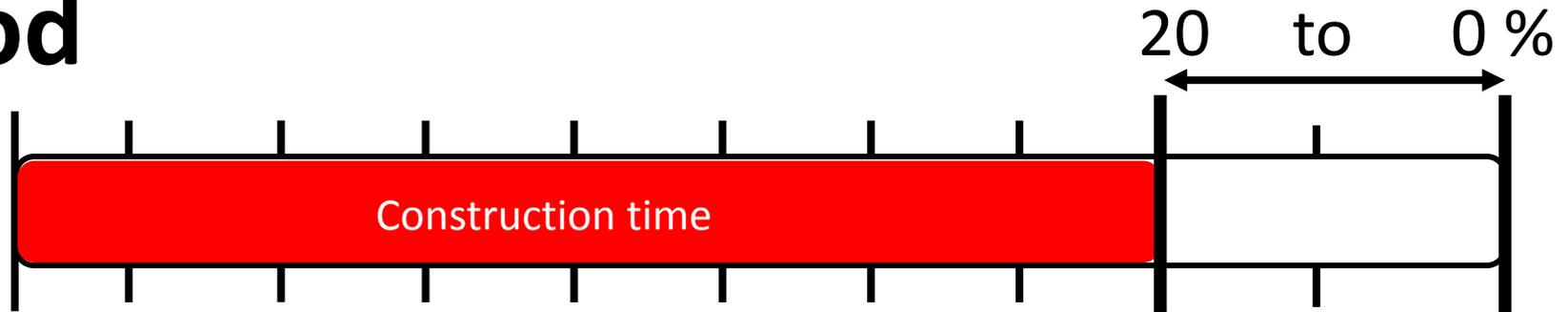
Project Delivery



Acceleration Goals

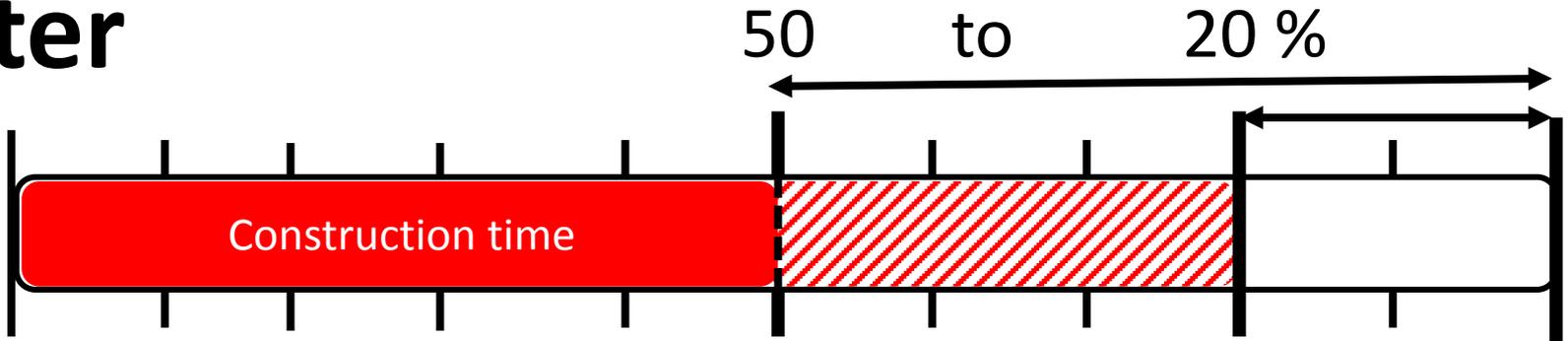


Good



reduction in time to complete project

Better





CAUTION

**Not All Projects Are
Suitable for
Accelerated Construction**

Agenda



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8:30-8:45	Welcome	Epps
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9:00-9:30	TxDOT's Interest	Hopmann
9:30-9:50	Project Selection Economics	Glover
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10:10-10:40	Project Development	Bostic
10:40-11:00	Accelerated Bridge Construction	Austin, Richardson
11:00-11:20	Design Considerations	Graf
11:20-11:30	Traffic/Safety	Norman
11:30-11:40	Public Information	Threlkeld
11:40-12:00	Construction	Ford
12:00-12:45	LUNCH	

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ACCELERATED CONSTRUCTION DOCUMENTS

- Briefs
- Implementation Reports
- Presentations



AC-B-17-04 ACCELERATED CONSTRUCTION GUIDELINES

BACKGROUND

The costs of delays during construction are in general more costly than delays associated with other elements of the delivery process. Traffic delays due to construction are extremely costly on high traffic volume facilities. Project costs can be in excess of the actual construction project. In addition, adjacent businesses impacted by user costs, can also be significant and should be included in the economic impact analysis.

The combination of these economic impacts with the direct costs of construction, the time and resources spent directly by the public agency and society; and the indirect costs of the construction zone is the visible and perhaps the most significant impact on the delivery of the project. It is necessary that additional attention be given to the economic impact analysis of selected highway projects.

When new approaches are used, contractors need opportunities to deliver the final product. Material suppliers need timely delivery and need to develop relationships with paving materials. Provide training and support to work longer hours. Financial

AND SELECTION

ment Process" implementation of any accelerated construction and planning process in the following items:

1. Project

specifications and

accelerated construction on Form 2229. Guidelines for Traffic Control, 2) "Traffic Control," 2) "Traffic Control."



District Workshops on Accelerated Construction

Welcome

AC-PP-17-01

Jon Epps



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November 7, 2017



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

by

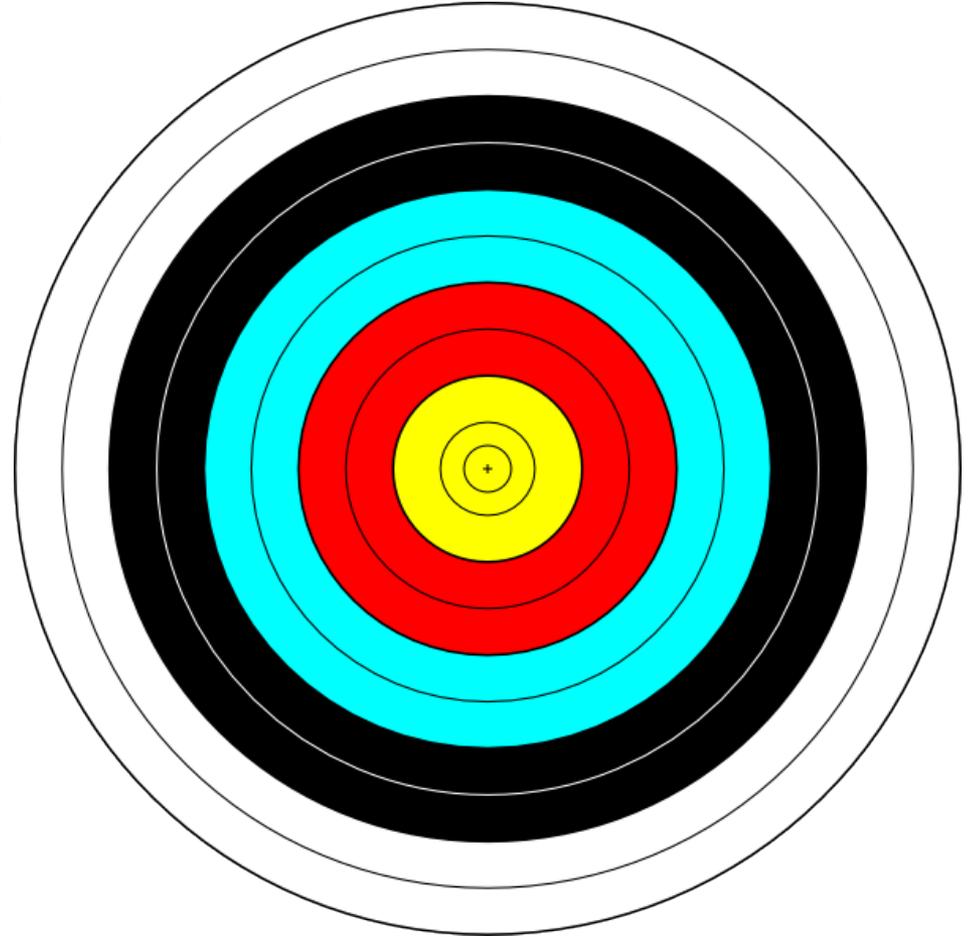
Brianne A. Glover, J.D.

David R. Ellis, Ph.D.

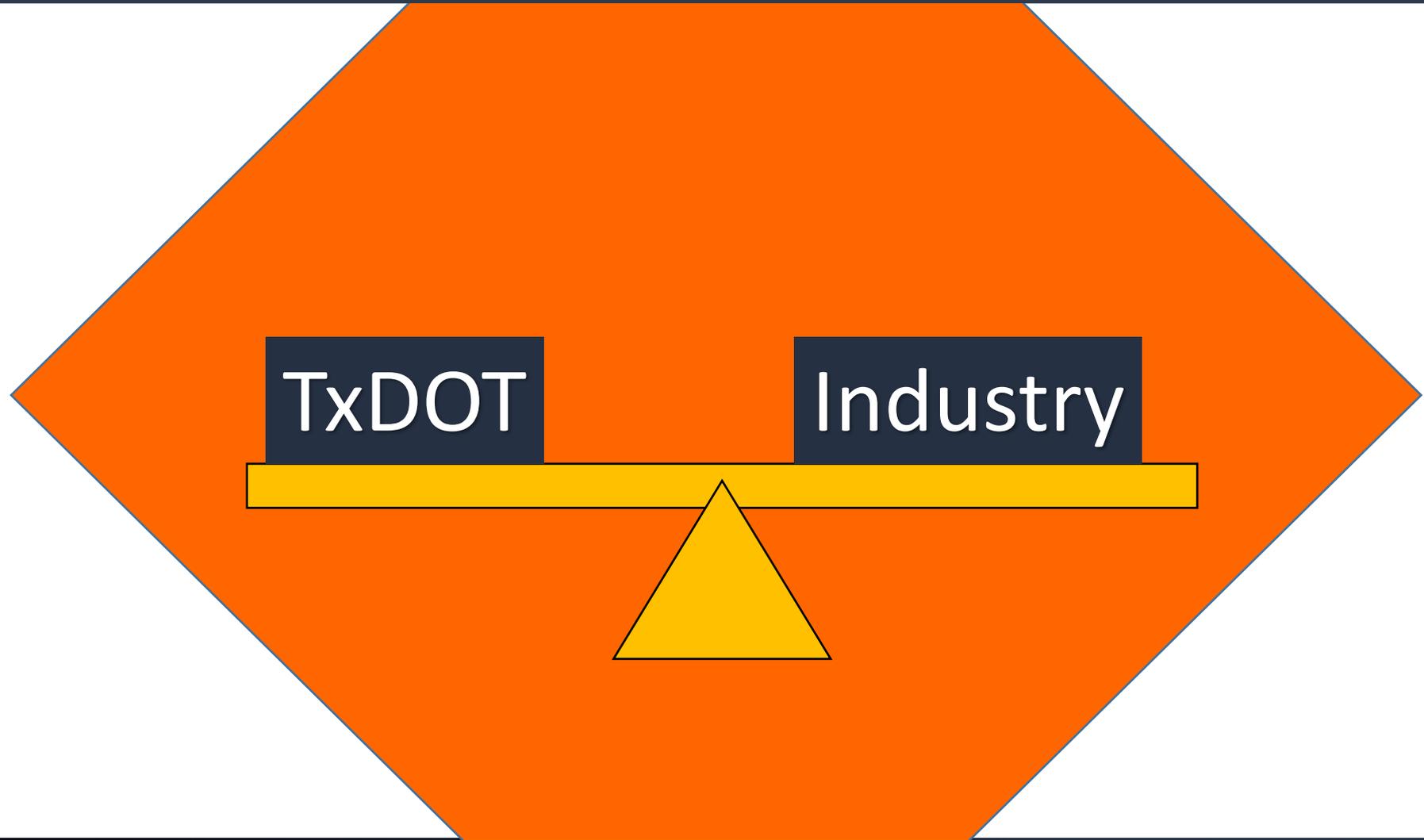
Workshop Goals



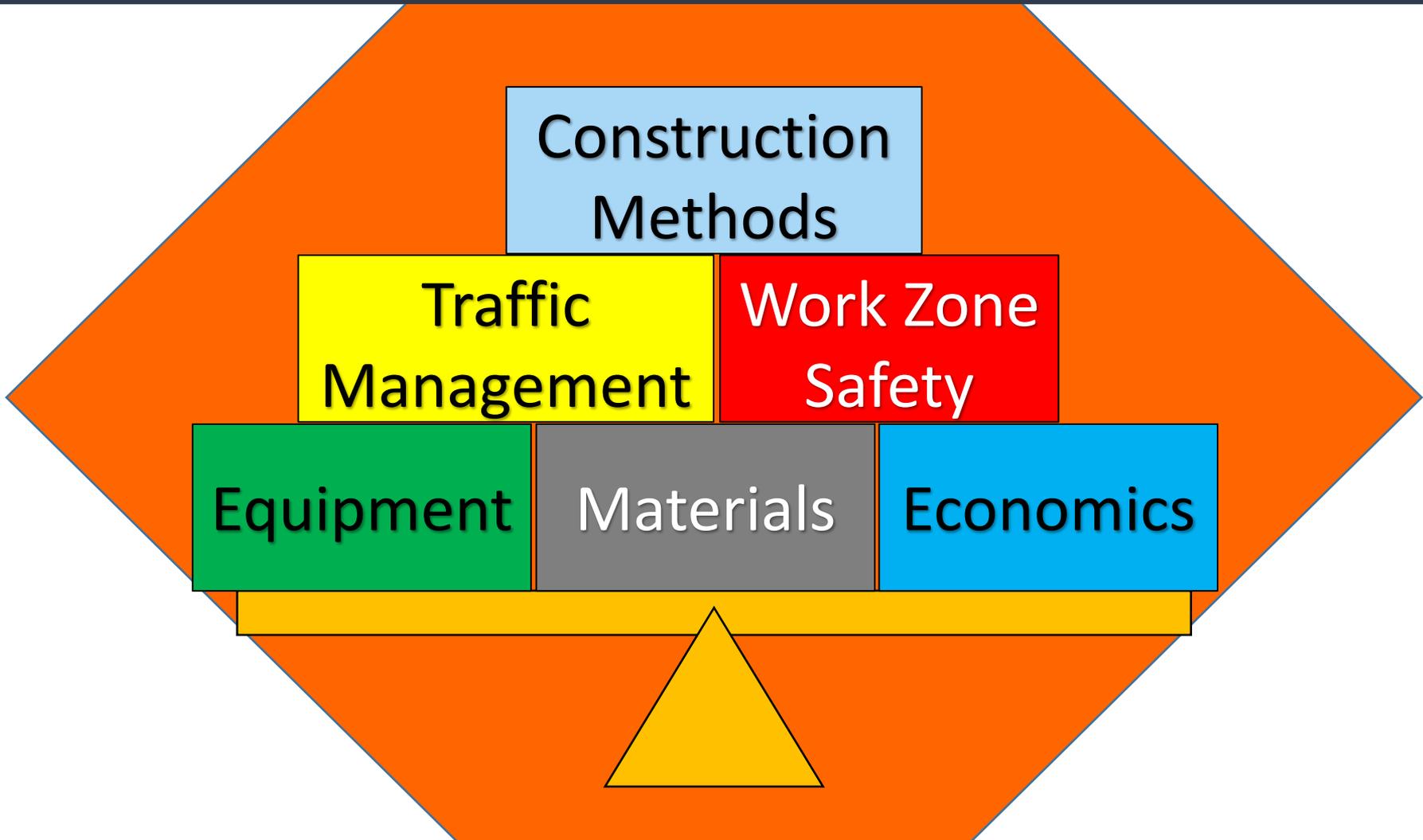
- Information sharing
- Existing TxDOT “tools”
- Identify needed “tools” & “policies”



Accelerated Construction



Accelerated Construction





Introductions



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



District Workshops on Accelerated Construction



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
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November 7, 2017



Texas
Department
of Transportation



Texas A&M
Transportation
Institute



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)

Vehicles Miles	+80 %
Drivers	+31 %
Lane Miles	+ 3.8%

Aging System

40 % Bridges +40 Years Old
Pavements Exceeded
Design Life



+80%



+31%



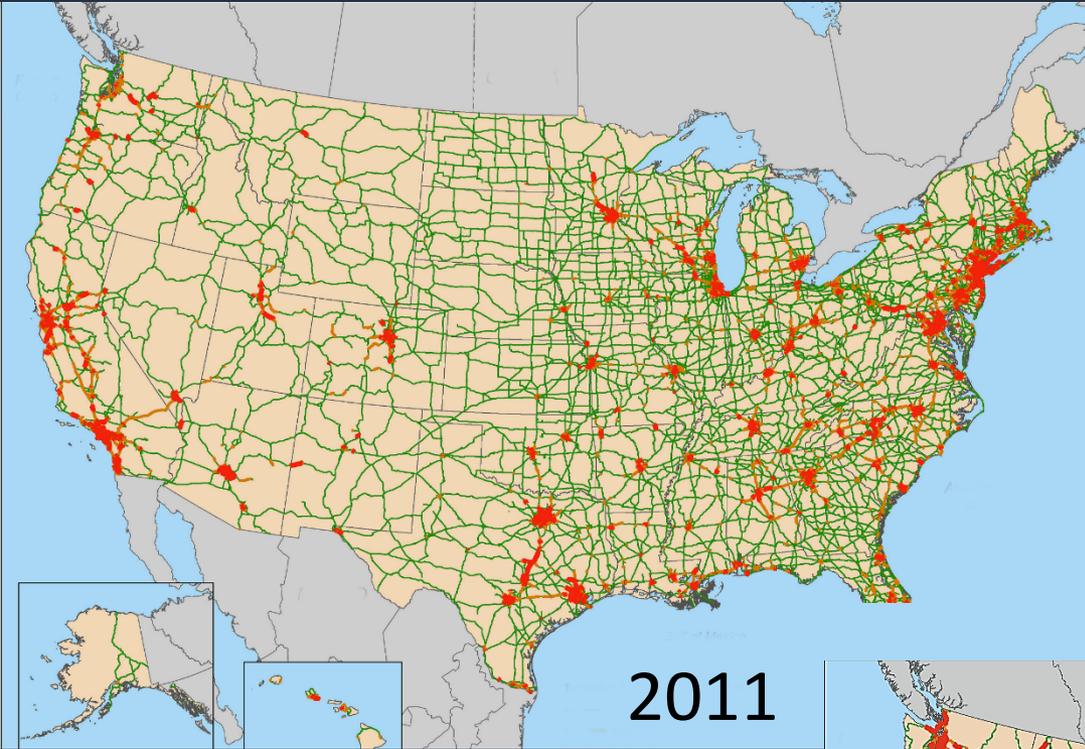
+3.8%



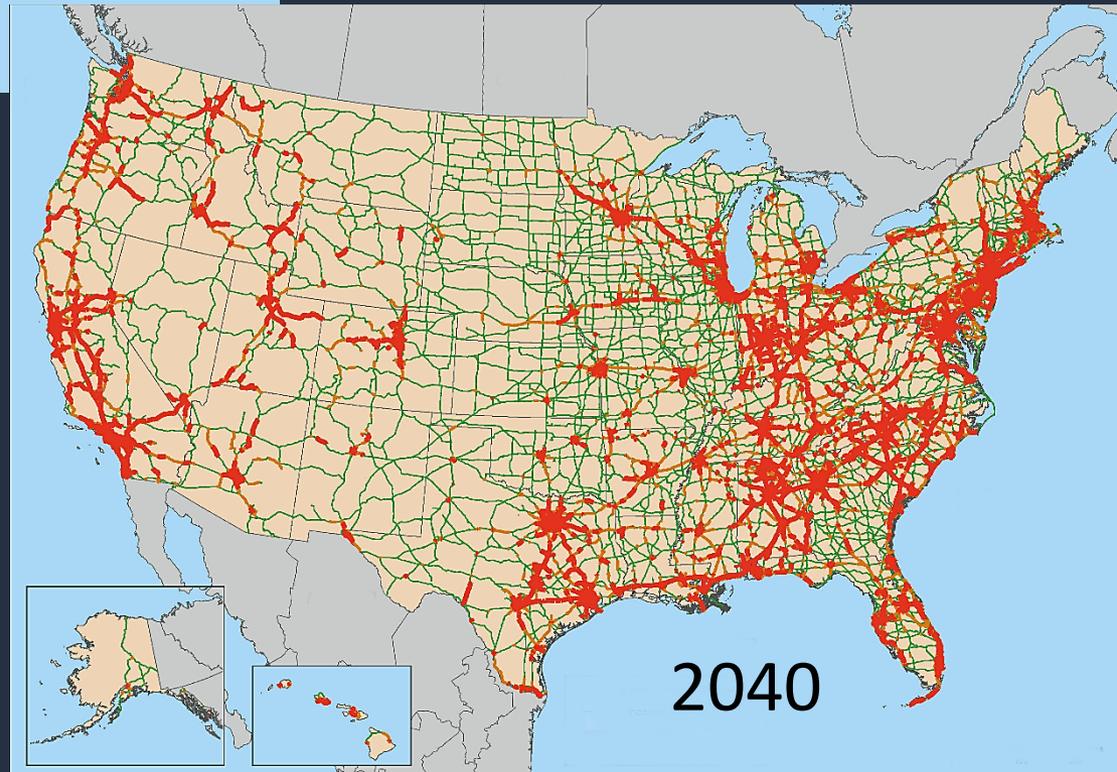
Accelerated Construction Skill Sets

<ul style="list-style-type: none">• Financing	<ul style="list-style-type: none">• Utilities	<ul style="list-style-type: none">• Long Life Bridges
<ul style="list-style-type: none">• Contracting	<ul style="list-style-type: none">• ROW	<ul style="list-style-type: none">• Long Life Pavements
<ul style="list-style-type: none">• Work Zone	<ul style="list-style-type: none">• Railroad	<ul style="list-style-type: none">• Quality Control
<ul style="list-style-type: none">• Mobility	<ul style="list-style-type: none">• Communication /Outreach	<ul style="list-style-type: none">• Modular/Prefab Construction
<ul style="list-style-type: none">• Corridor Improvement	<ul style="list-style-type: none">• Training	<ul style="list-style-type: none">• Constructability
<ul style="list-style-type: none">• Worker Health & Safety		

Peak-Period Congestion on NHS



2011

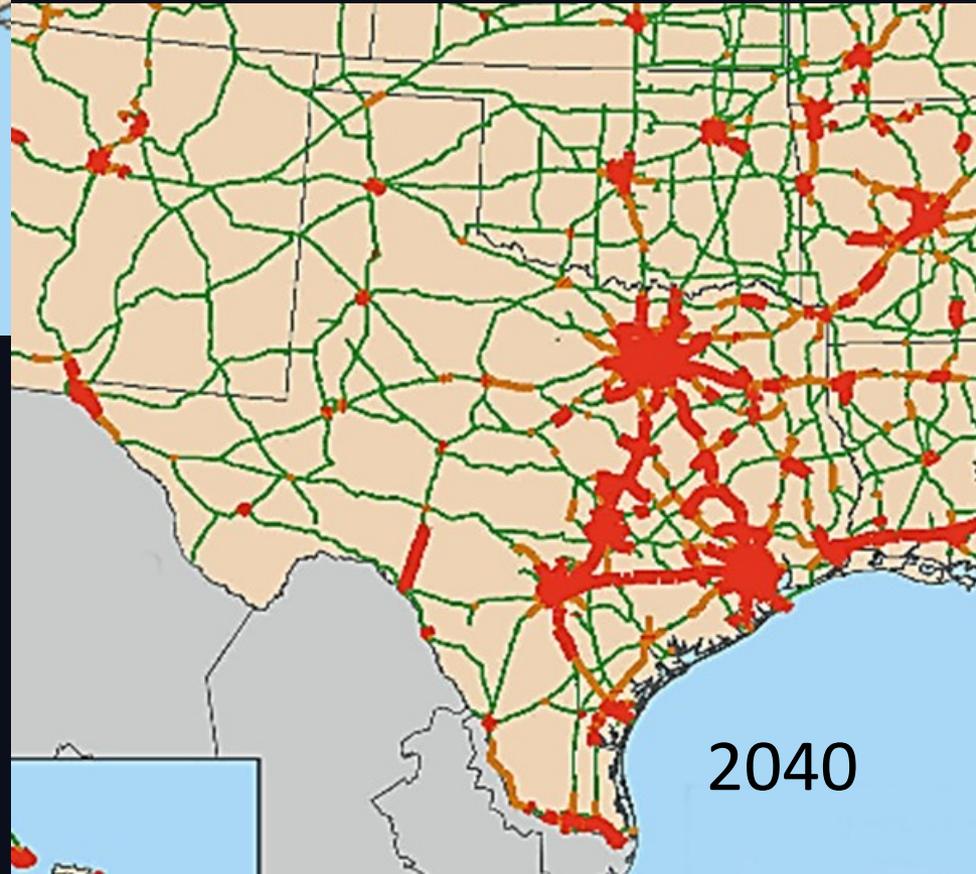
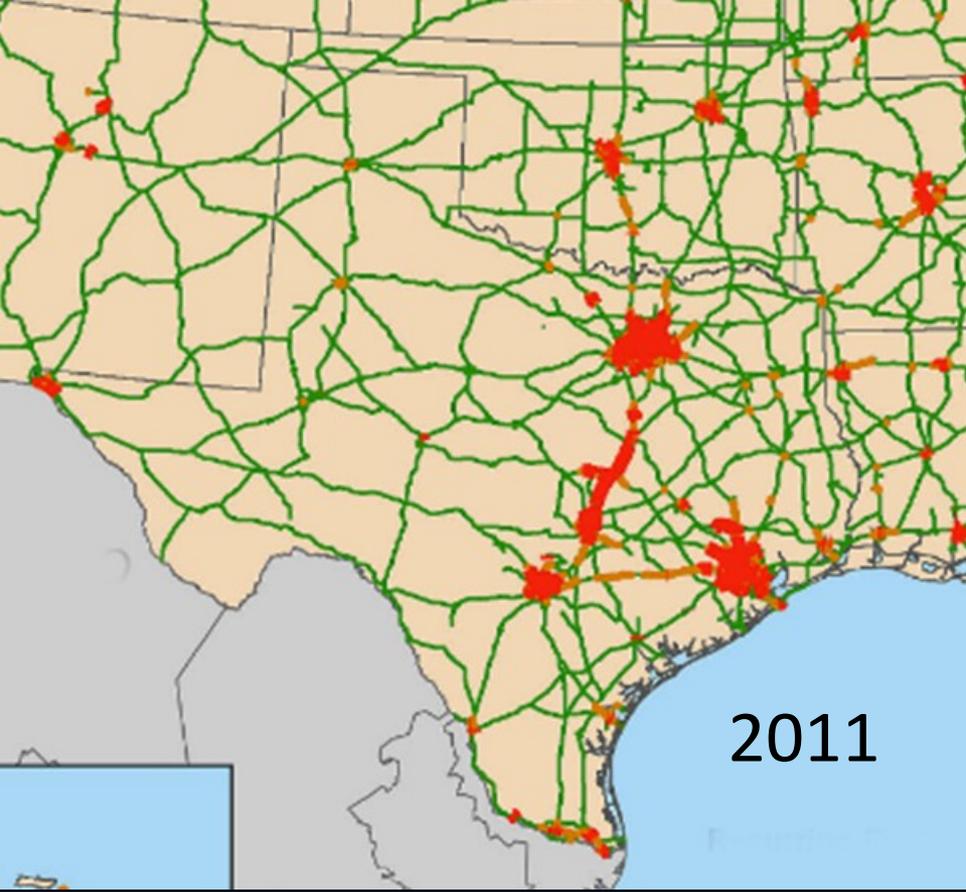


2040

Recurring Peak-Period Congestion

-  Uncongested
-  Congested
-  Highly Congested

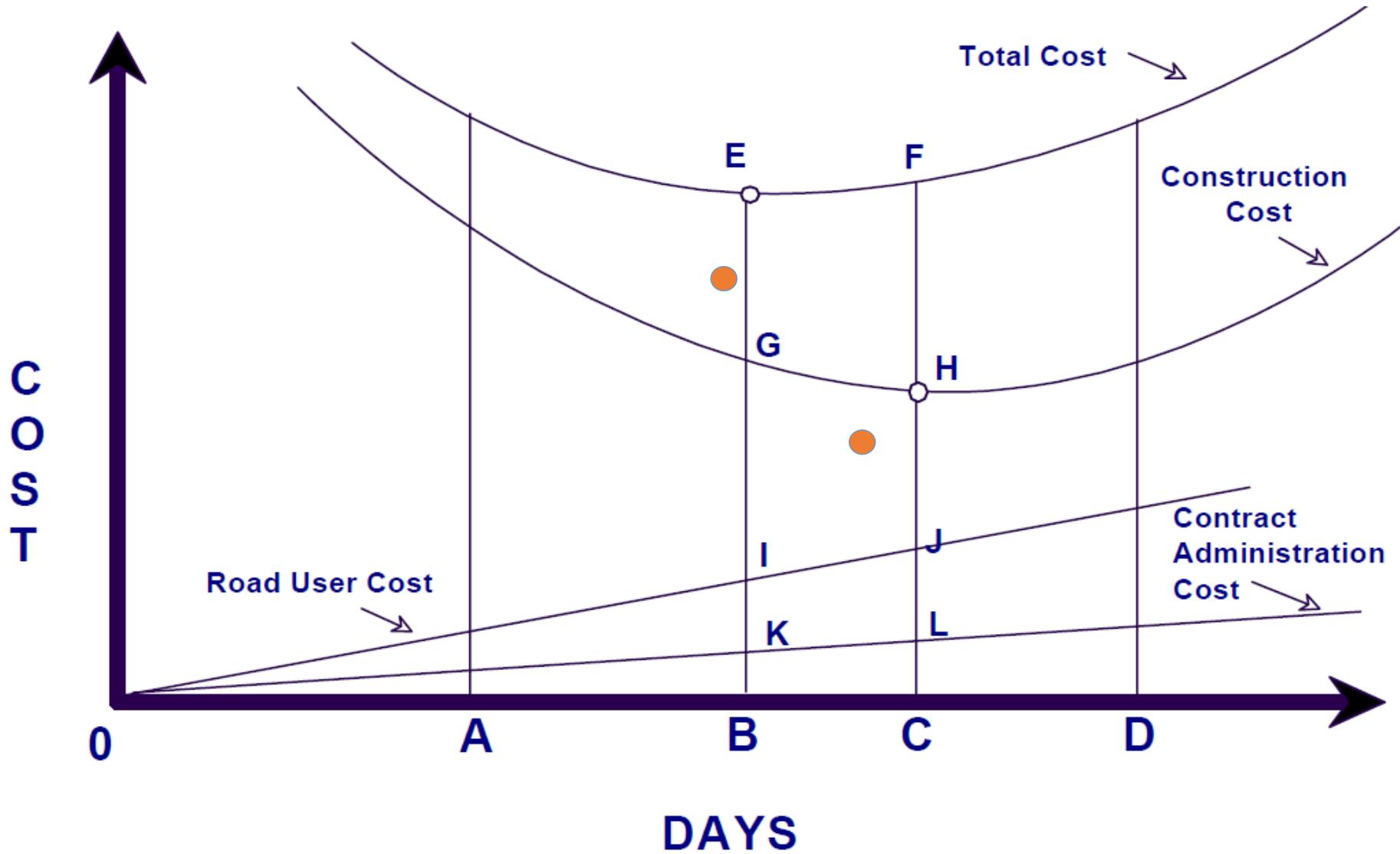
Peak-Period Congestion on NHS



Recurring Peak-Period Congestion

-  Uncongested
-  Congested
-  Highly Congested

Project Costs by Type, Related to Duration



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)
- Rubblization 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)

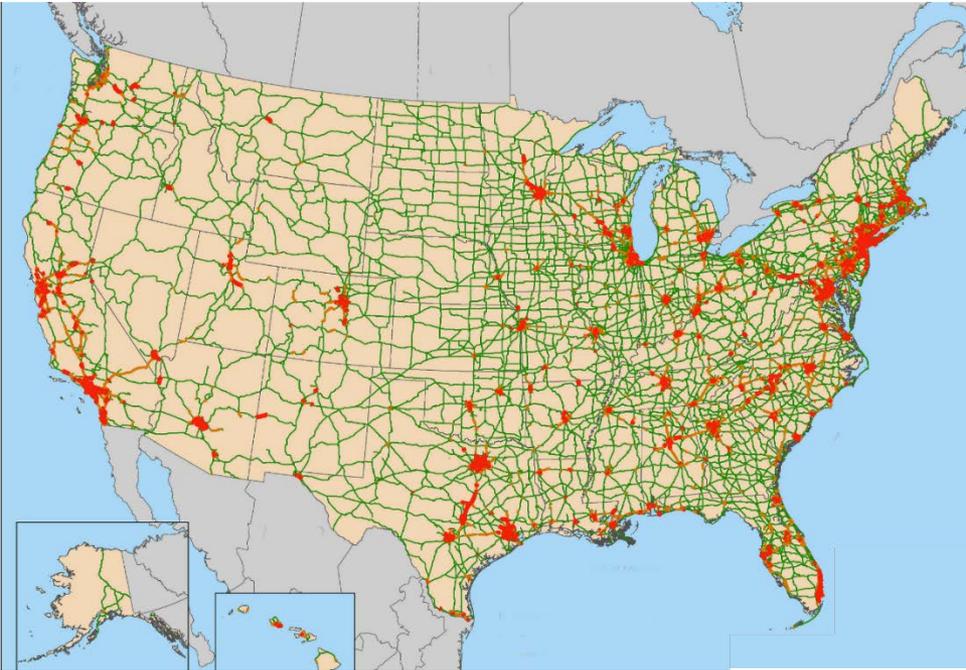
- Complex project involving utilities
- Prequalified bidders
- Req'd 12-hr days, 7 d/wk (14 on/2off)
- 3 milestones with up to \$120k bonus for each
- Penalty - \$20k/day
- Urban area – intersections on weekend, noise mitigation at night
- PR campaign was successful

Summary

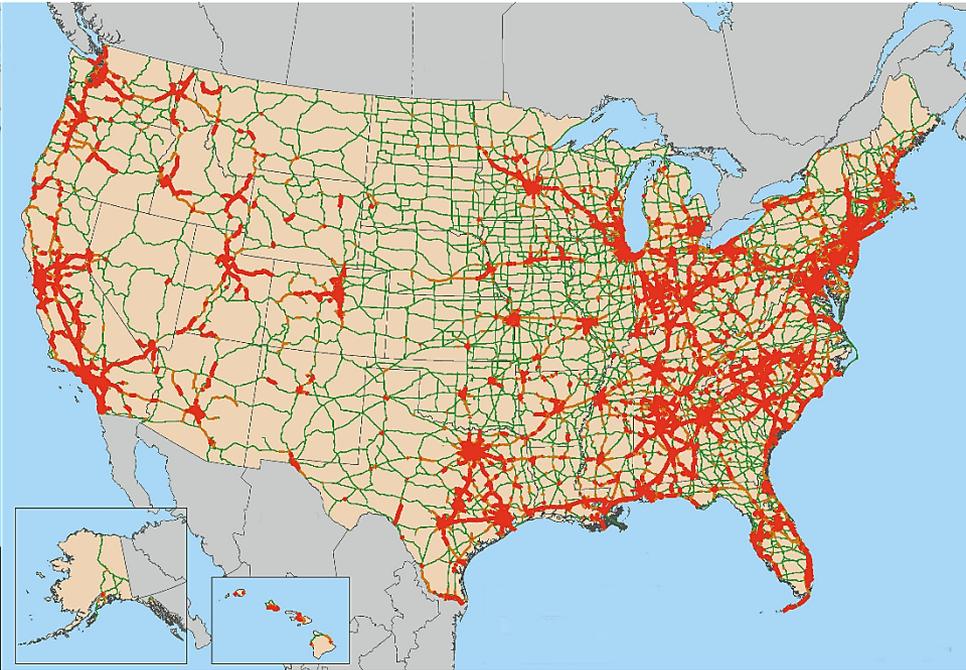


- Accelerated construction not new
- Requires
 - Right application
 - Incentives/disincentives
 - Recognition of and planning for risks
 - Flexibility on part of agency and contractor
 - Innovative thinking
 - Public engagement
- Will become more standard with time

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

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November 7, 2017



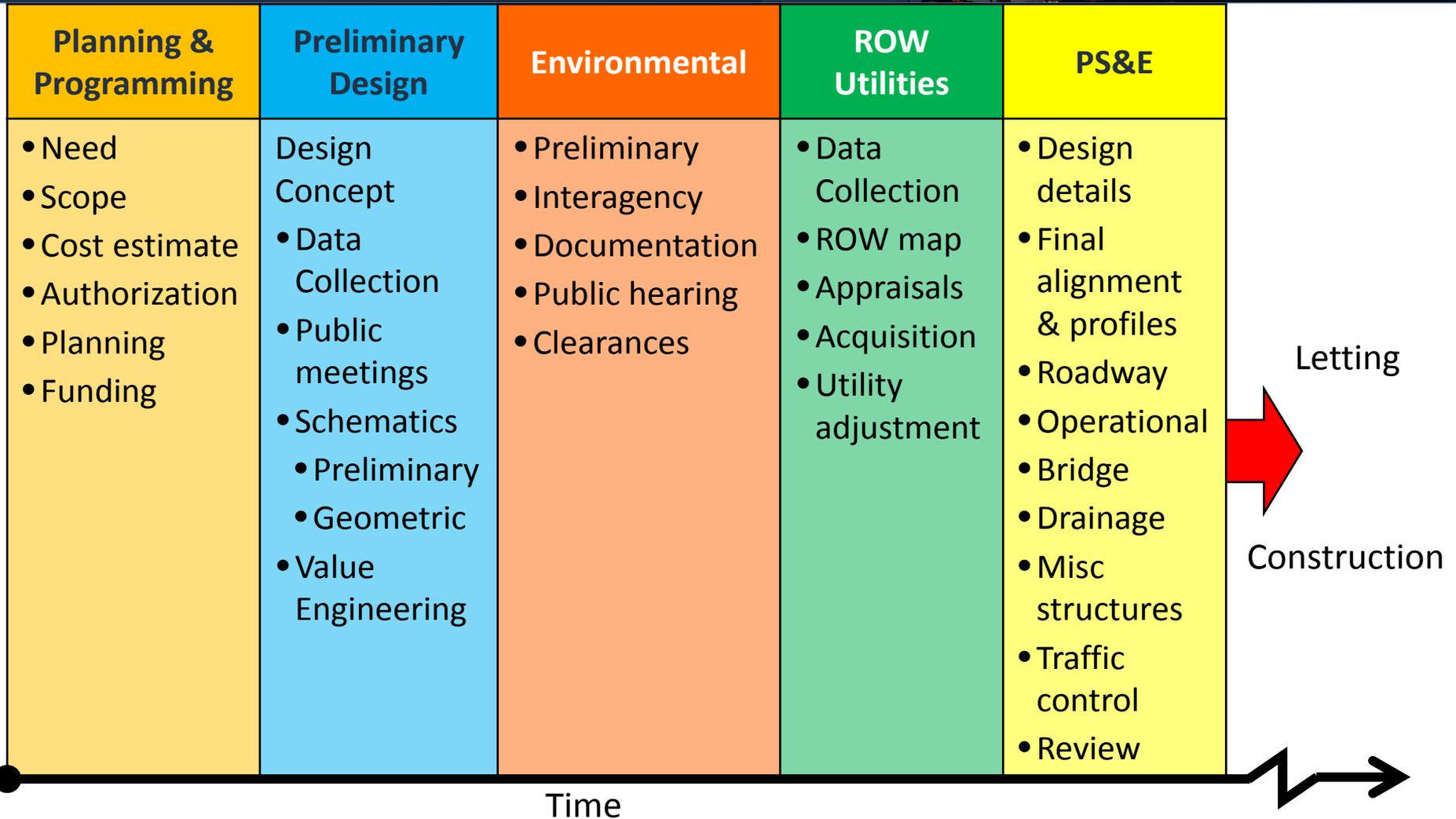
Outline



- **Background**
- Texas Landscape
- Texas History
- Opportunities
- Workshop Outcomes



Project Delivery



Economic Considerations-Examples

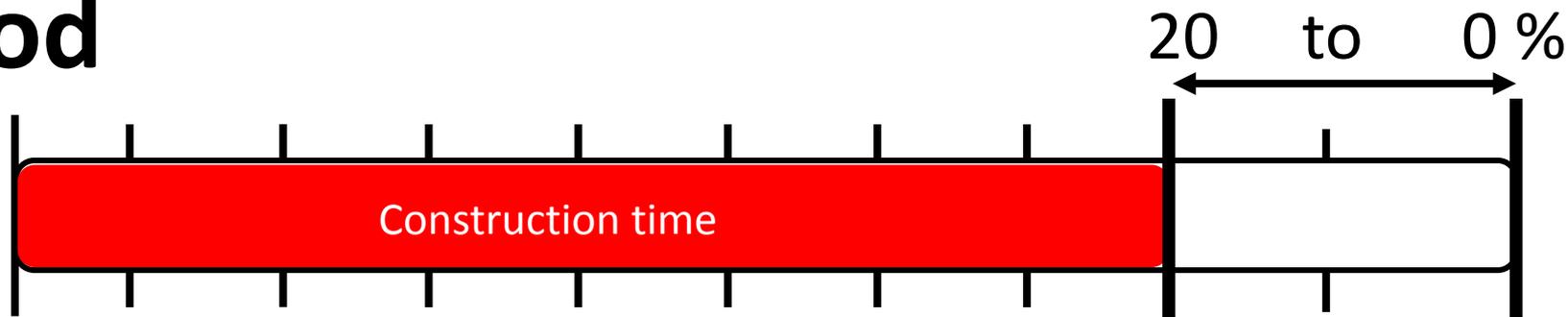
Project	Per Month Costs	Project Costs
Widen FM road from 2-lanes to 4-lanes (2.7 miles)	\$ 96,000	\$ 3.5M
Widen Freeway (2.6 miles)	\$297,000	\$17.8M
Interchange in urban area (1.5 miles)	\$447,000	\$ 5.1M



Acceleration Goals

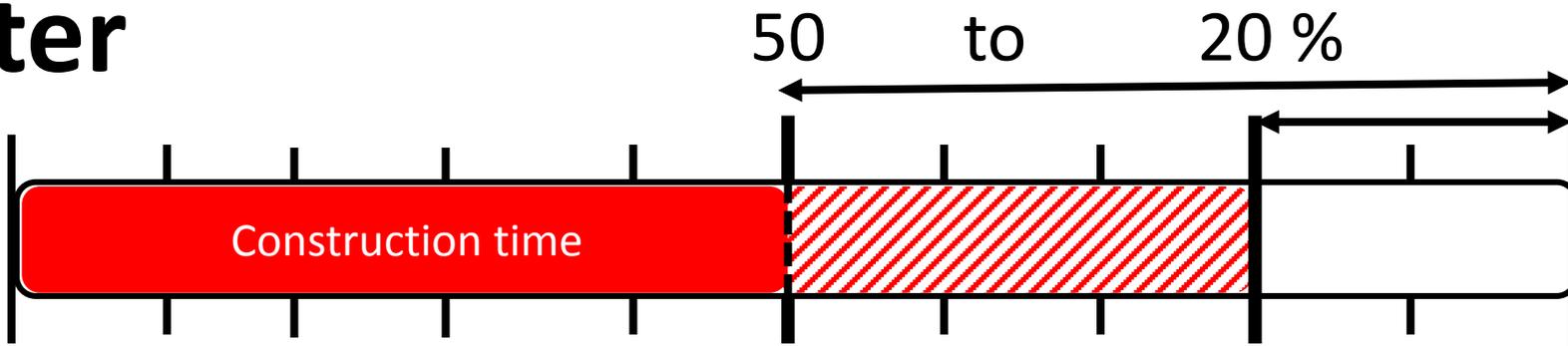


Good



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



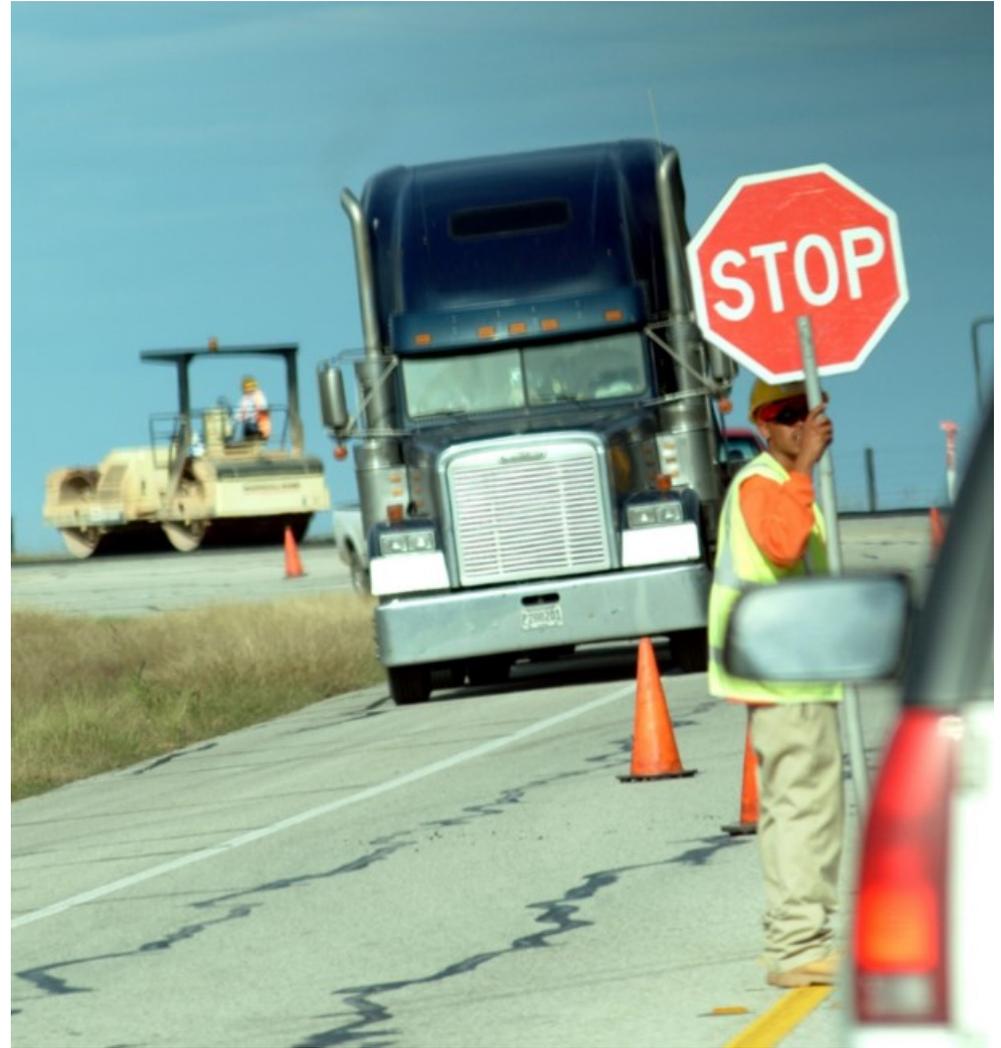
Reduce Construction Time

- Bridges/Culverts (ABC)
- Pavements





Not for every
project



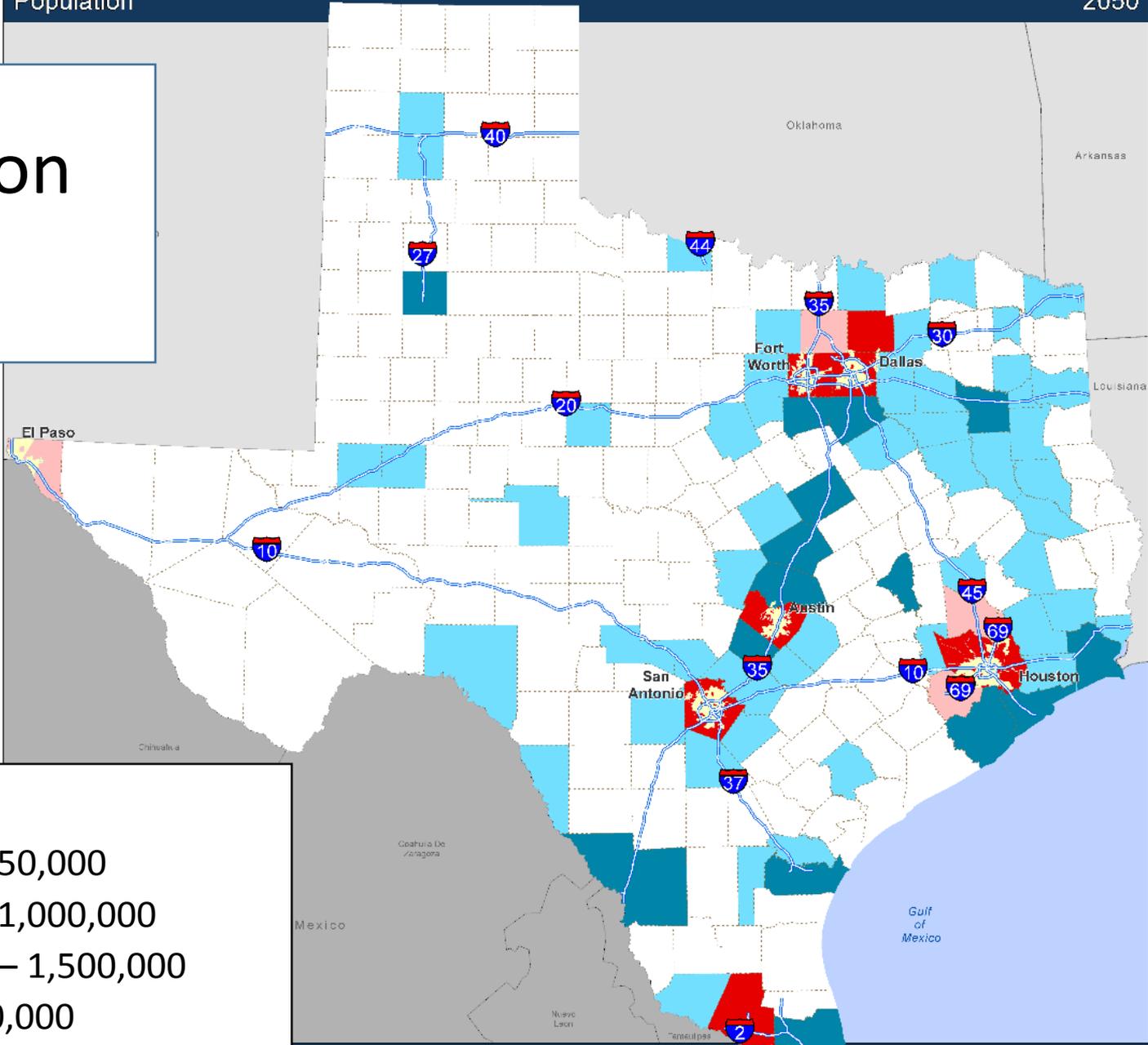
Outline



- Background
- **Texas Landscape**
- Texas History
- Opportunities
- Workshop Outcomes



Population 2050





2017 Unified Transportation Program (UTP)

2017-2026
Transportation Planning & Programming



Unified Transportation Plan



We Build Texas

*Field Guide to
Successful Project Delivery*

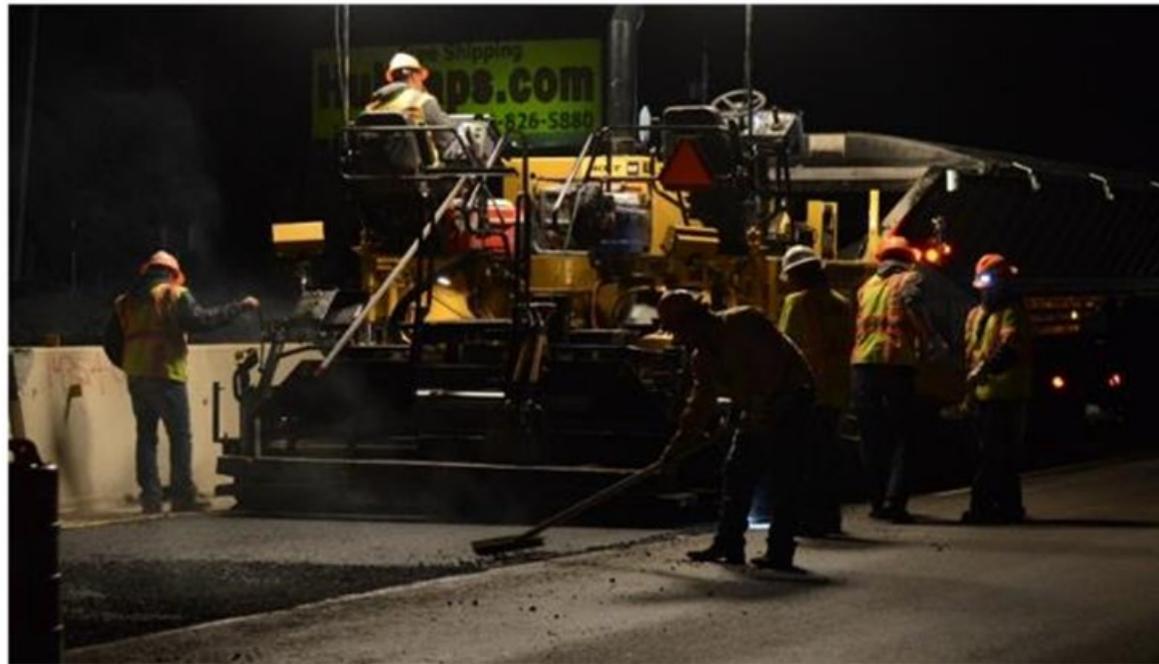


We build Texas – Safely
We build Texas – Quality
We build Texas – On Time
We build Texas – Together

Working together to successfully deliver projects.



We Build 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



Wes Heald



- 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



SCAN TEAM REPORT
NCHRP Project 20-68A, Scan 07-02

Best Practices in Accelerated Construction Techniques

Supported by the
National Cooperative Highway Research Program

The information contained in this report was prepared as part of NCHRP Project 20-68A U.S. Domestic Scan, National Cooperative Highway Research Program.

SPECIAL NOTE: This report **IS NOT** an official publication of the National Cooperative Highway Research Program, Transportation Research Board, National Research Council, or The National Academies.

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
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- **Opportunities**
- Workshop Outcomes



Materials

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



Equipment

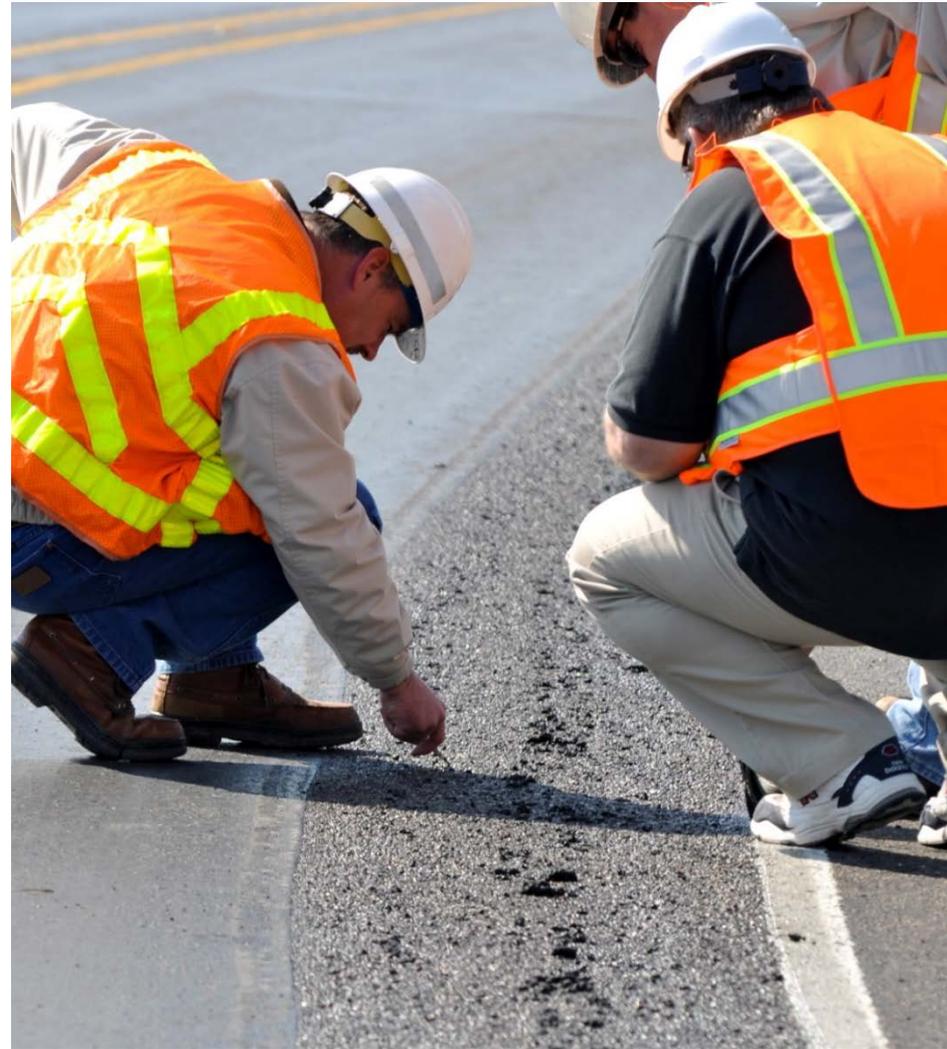


- Materials handling
- Demand for equipment
- Prototype/production unit/redesign
- Cost



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

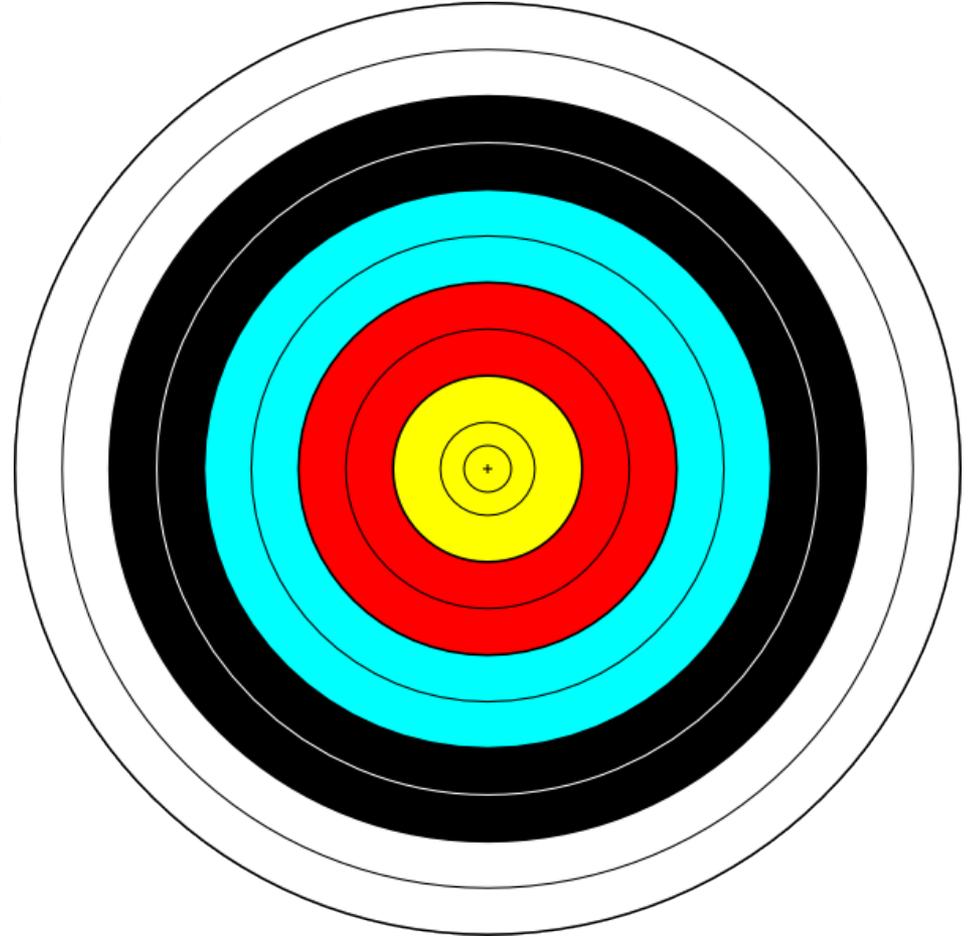
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Workshop Goals



- Information sharing
- Existing TxDOT “tools”
- Identify needed “tools” & “policies”





CAUTION

Not All Projects Are
Suitable for
Accelerated Construction

District Workshops on Accelerated Construction



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November 7, 2017



District Workshops on Accelerated Construction Economic Screening Tools

AC-PP-17-04

David Ellis

Brianne Glover

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MCM Elegante Suites
November 7, 2017



*Texas
Department
of Transportation*



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



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

Project Parameters	Values
Average Operating Speed	50
Segment Length (miles)	6.0
Pre Construction ADT	215,000
Percent Trucks	15%
Project Region	Urban
Retail (SQFT)	2,000,000
Travel Time per Trip (minutes)	7.2

NOTE: There can be significant variation in economic impact due to the type of business as well as type of area (urban, suburban and rural). For the purposes of this model retail sales per square foot was used as the default method of calculation. Further, while the model has three different area types from which to chose, even within those area types, there can be significant variation in sales per square foot depending on the specific location. In terms of economic impact, this model provides general guidance only.

Traditional Construction Parameters	Values
Total Project Period (calendar days)	900
Percent of ADT that is Traveling During Peak Periods	75%

Accelerated Construction Parameters	Values
Added Cost of Accelerate Construction	\$200,000,000
Added Cost of Incentives	
Total Project Period (calendar days)	365
Percent of ADT that is Traveling During Peak Periods	75%

Traditional Construction Scenario	Values
Automobile Travel Time Value	\$331,828,313
Truck Travel Time Value	\$102,219,084
Total Travel Time Value	\$434,047,397
Automobile Operating Cost	\$99,277,110
Truck Operating Cost	\$78,576,480
Total Operating Cost	\$177,853,590

Accelerated Construction Scenario	Values
Automobile Travel Time Value	\$134,574,816
Truck Travel Time Value	\$41,455,517
Total Travel Time Value	\$176,030,333
Automobile Operating Cost	\$40,262,384
Truck Operating Cost	\$31,867,128
Total Operating Cost	\$72,129,512



Preconstruction Conditions

Project Parameters

Values

Average Operating Speed

50

Segment Length (miles)

6.0

Pre Construction ADT

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Percent Trucks

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Project Region

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Project Level Economic Screening Tool



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Project Level Economic Screening Tool



Construction Conditions

Traditional Construction Parameters	Values
Segment 1:	
Days	450
Segment Length	3
Average Operating Speed (Peak)	10
Average Operating Speed (Off-Peak)	45
Percent of Traffic Diverted	20%
Segment 2:	
Days	450
Segment Length	3
Average Operating Speed (Peak)	10
Average Operating Speed (Off-Peak)	45
Percent of Traffic Diverted	20%
Segment 3:	
Days	
Segment Length	
Average Operating Speed (Peak)	
Average Operating Speed (Off-Peak)	
Percent of Traffic Diverted	
Segment 4:	
Days	
Segment Length	
Average Operating Speed (Peak)	
Average Operating Speed (Off-Peak)	
Percent of Traffic Diverted	

Accelerated Construction Parameters	Values
Segment 1:	
Days	180
Segment Length	3
Average Operating Speed (Peak)	10
Average Operating Speed (Off-Peak)	45
Percent of Traffic Diverted	20%
Segment 2:	
Days	185
Segment Length	3
Average Operating Speed (Peak)	10
Average Operating Speed (Off-Peak)	45
Percent of Traffic Diverted	20%
Segment 3:	
Days	
Segment Length	
Average Operating Speed (Peak)	
Average Operating Speed (Off-Peak)	
Percent of Traffic Diverted	
Segment 4:	
Days	
Segment Length	
Average Operating Speed (Peak)	
Average Operating Speed (Off-Peak)	
Percent of Traffic Diverted	

Construction Conditions

Traditional Construction Parameters	Values	Accelerated Construction Parameters	Values
<i>Segment 1</i>		<i>Segment 1</i>	
Days	450	Days	180
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%

Construction Conditions

Traditional Construction Parameters	Values	Accelerated Construction Parameters	Values
<i>Segment 2</i>		<i>Segment 2</i>	
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%

Project Level Economic Screening Tool



Economic
Loss

- Sales
- State Sales Tax Revenue
- Local Sales Tax Revenue



Results

Traditional Construction Tools

Values

Total Road User Costs and Economic Loss	\$1,832,284,439
--	------------------------

Accelerated Construction Tools

Values

Total Road User Costs and Economic Loss	\$ 771,059,803
--	-----------------------

Traditional vs Accelerated

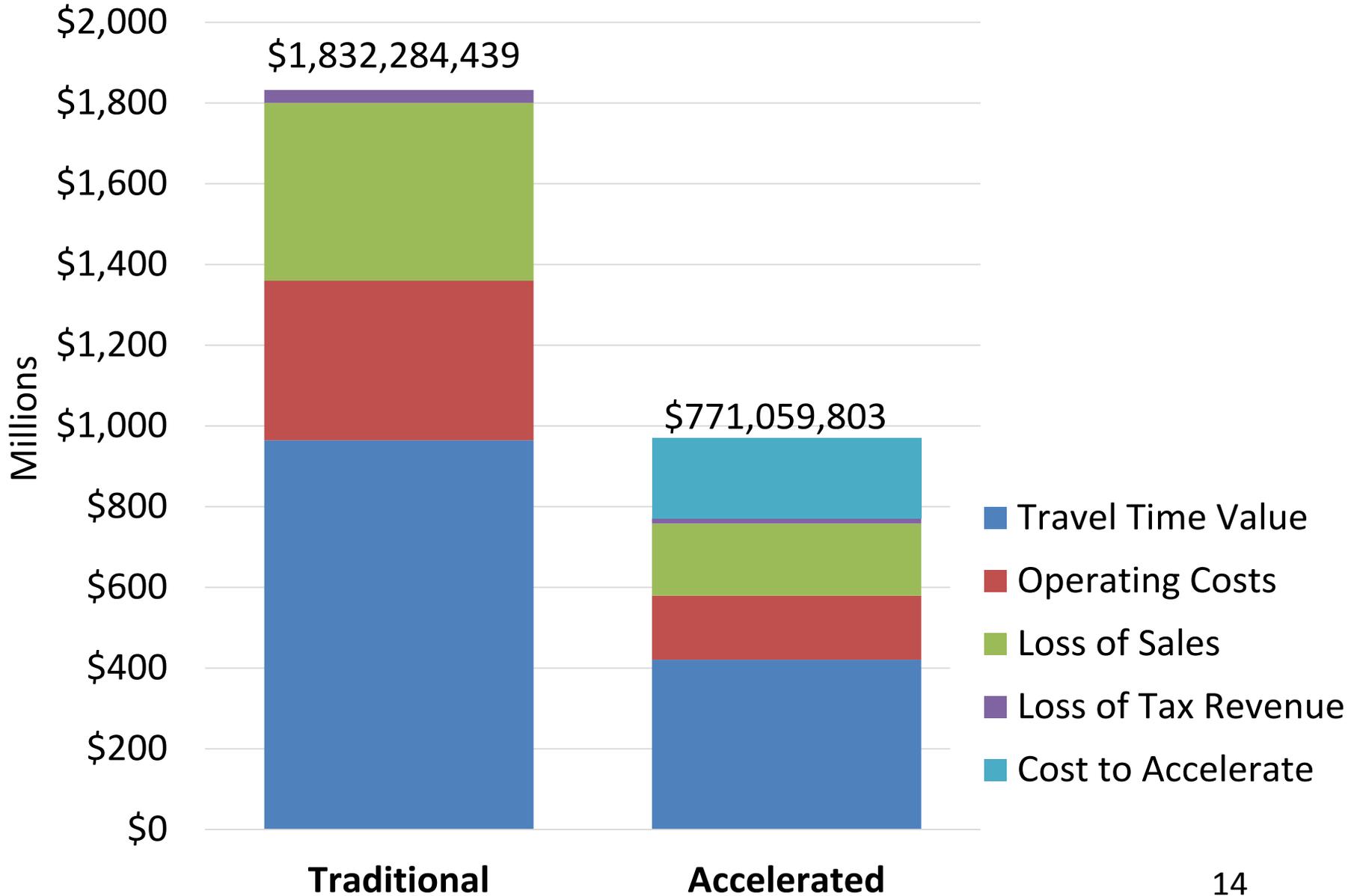
Values

Change in Road User Costs and Economic Loss	\$1,061,224,636
--	------------------------

Road User Cost and Economic Daily Cost	\$ 1,983,597
---	---------------------

B/C of Accelerated construction	5.31
--	-------------

Estimated User Costs and Economic Losses



District Workshops on Accelerated Construction

Contacts

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David Ellis
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Abilene
MCM Elegante Suites
November 7, 2017



*Texas
Department
of Transportation*



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



TxDOT RESOURCES

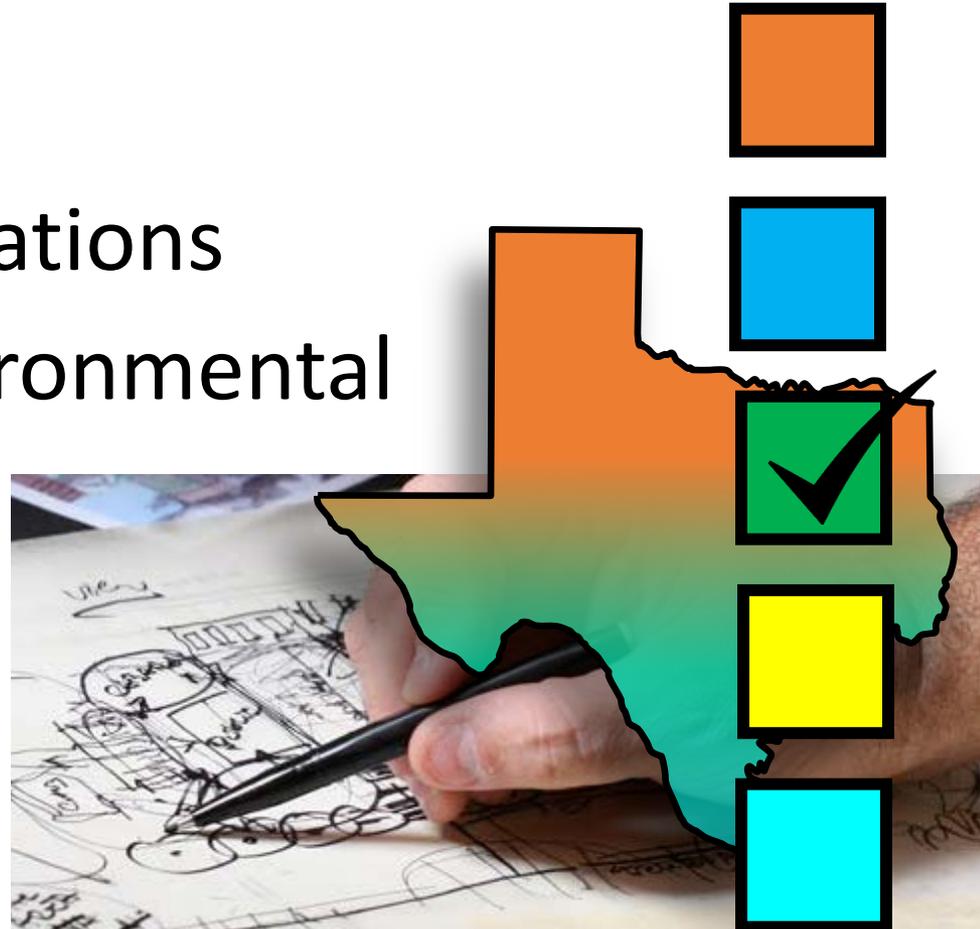


- Project Development Process Manual-2017
- Bridge Project Development Manual-2016
- PS&E Preparation Manual-2016
- Roadway Design Manual-2014
- Bridge Design Manual-2015
- Bridge Detailing Guide-2016
- Pavement Design Manual-2011
- Hydraulic Design Manual-2016
- Texas Manual on Uniform Traffic Control Devices -2014
- Accelerated Construction Strategies Guidelines – (Under Revision)



PROJECT SELECTION & PLANNING

- General Guides
- Economic Considerations
- ROW, Utilities, Environmental & Railroads
- Risk Assessment
- Public Information
- Other

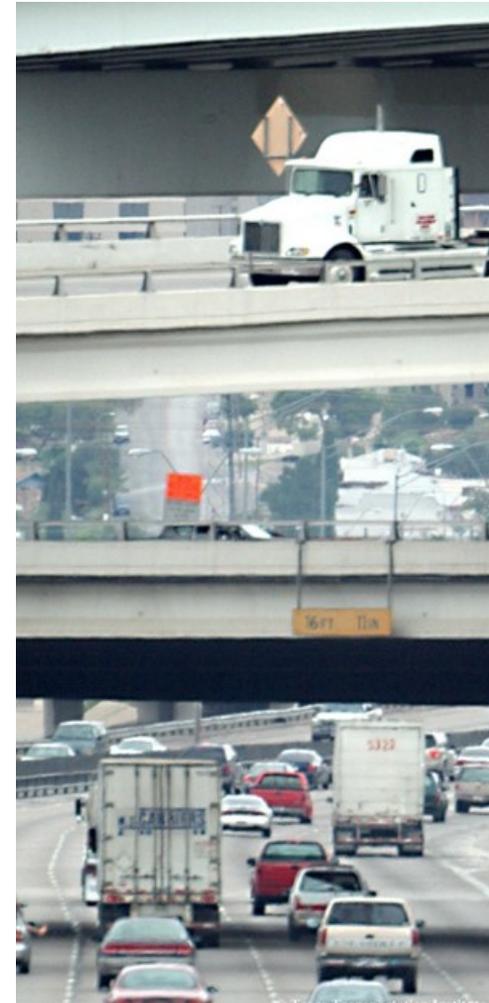


PROJECT SELECTION & PLANNING

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



PROJECT SELECTION & PLANNING

General Guidelines

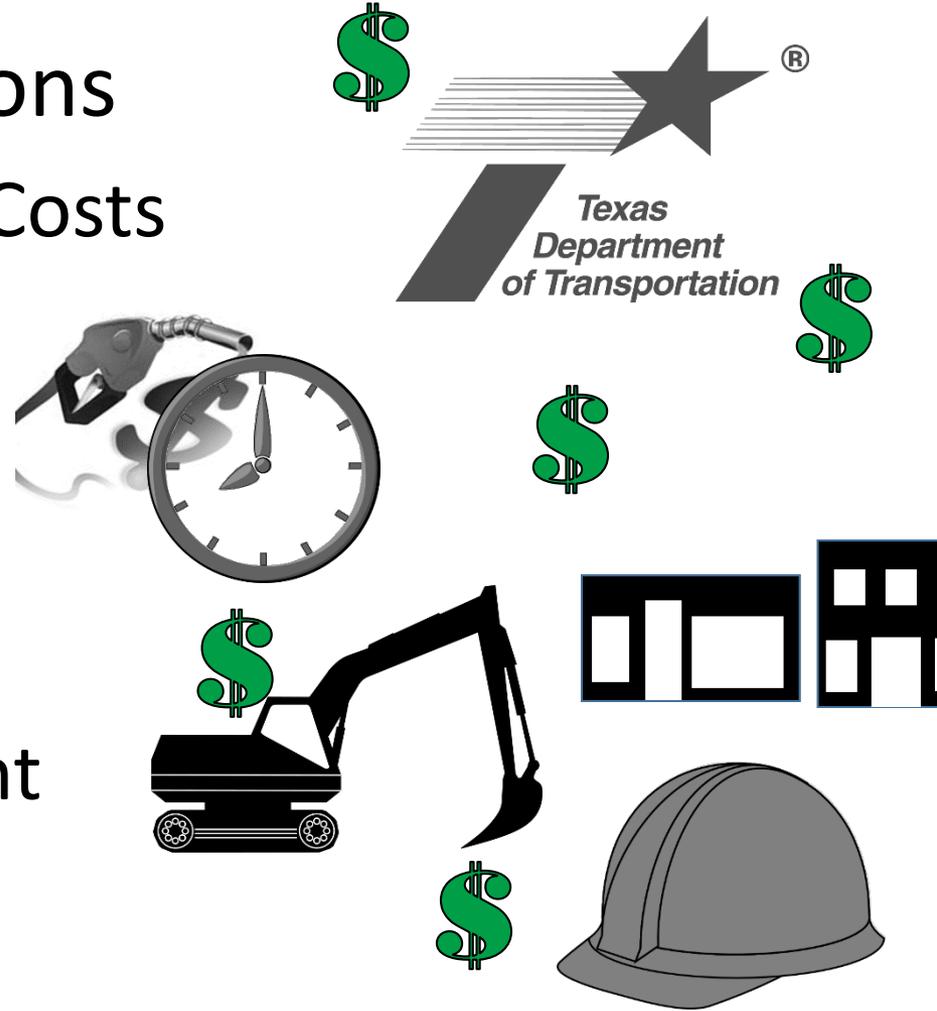
- Rural areas
 - Impact on small towns traffic flow
 - Impact on small town businesses
 - Intersections
- Key transportation routes for major industries
 - Energy development
 - Agriculture
 - Mining



PROJECT SELECTION & PLANNING

Economic Considerations

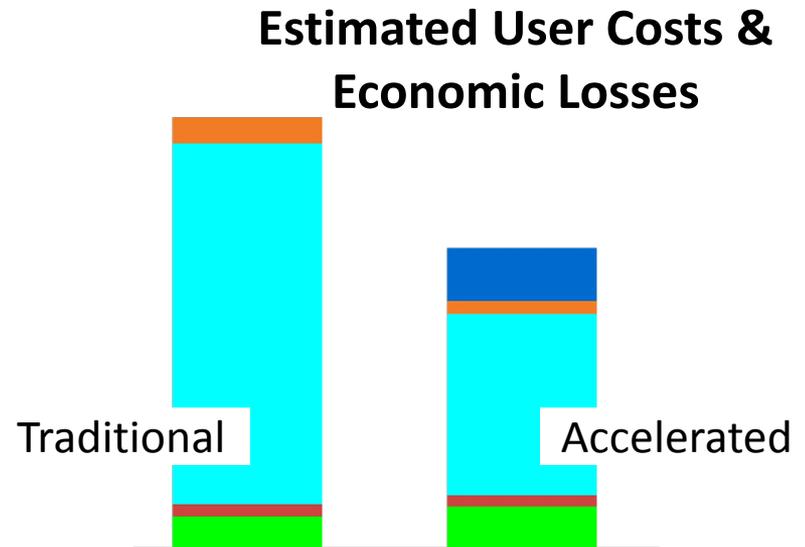
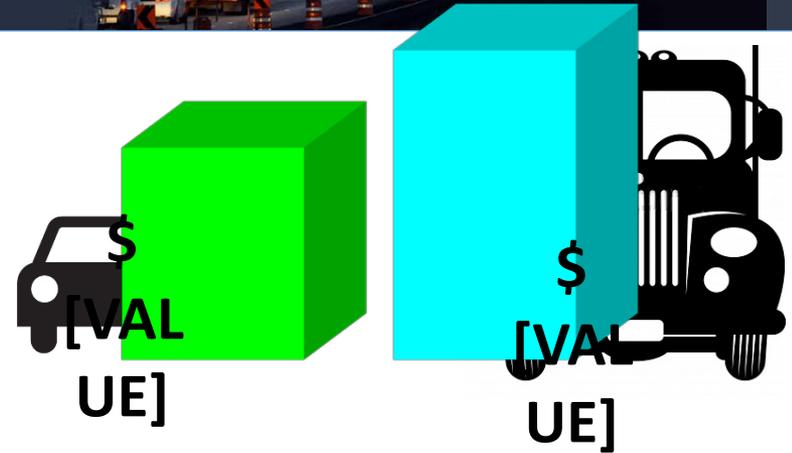
- Agency Administrative Costs
- Road User Costs
- Non-User Costs (adjacent businesses)
- Construction Costs
- Contractor Management Costs



PROJECT SELECTION & PLANNING

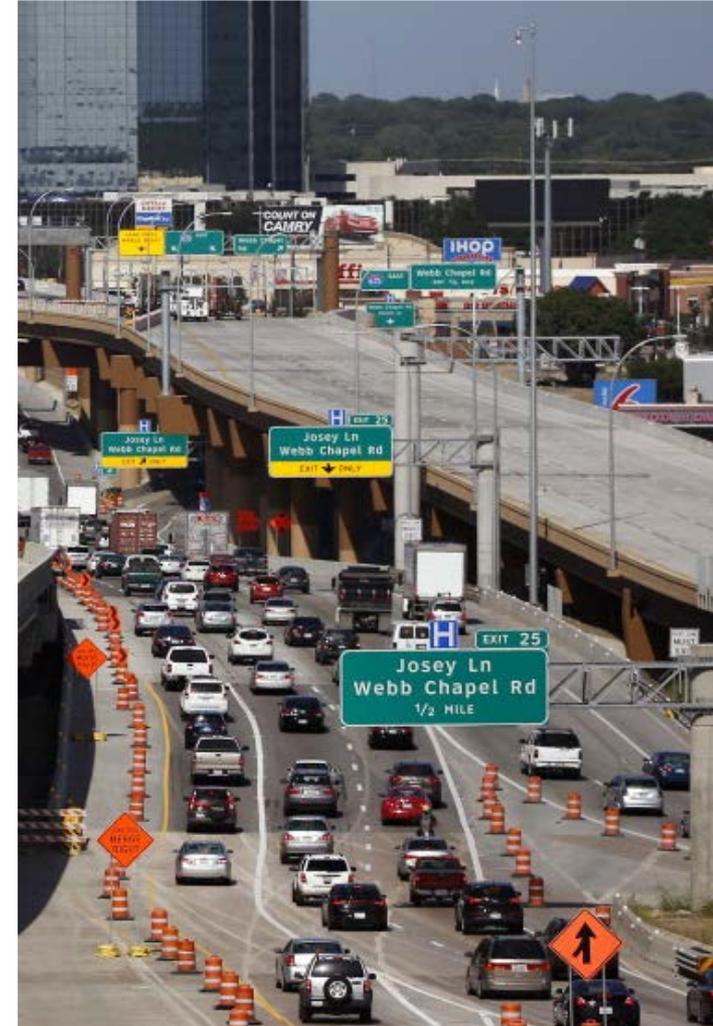
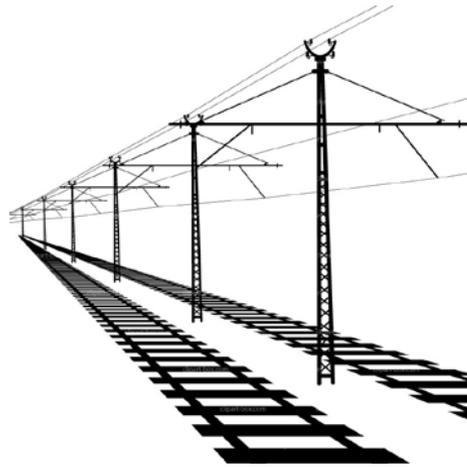
Calculation Tools

- TxDOT Road User Cost Calculator
- Project Level Economic Screening Tool



PROJECT SELECTION & PLANNING

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



PROJECT SELECTION & PLANNING



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

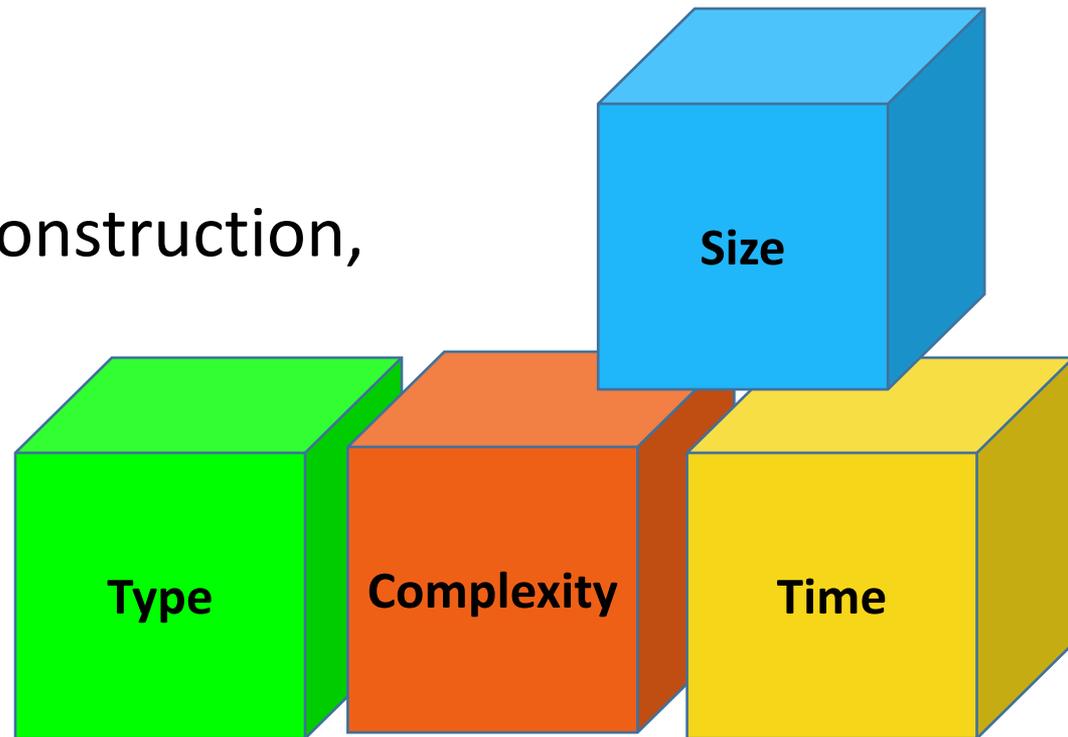


Contracting Methods



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

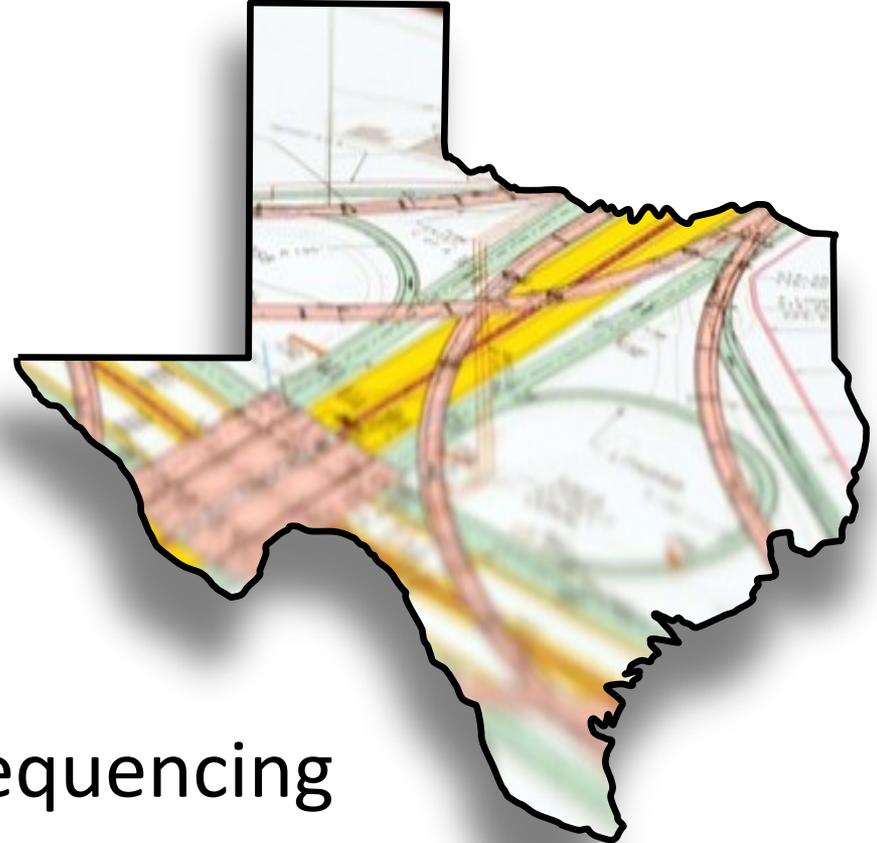
- A - Traditional bid for the unit prices multiplied by the contract quantities
- B - Time to complete the project x daily road user costs
- Road user costs provided by TxDOT
- Contract state minimum and maximum work days
- Contractors bids “time” is the “time” used for contract cost adjustments

A + B

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

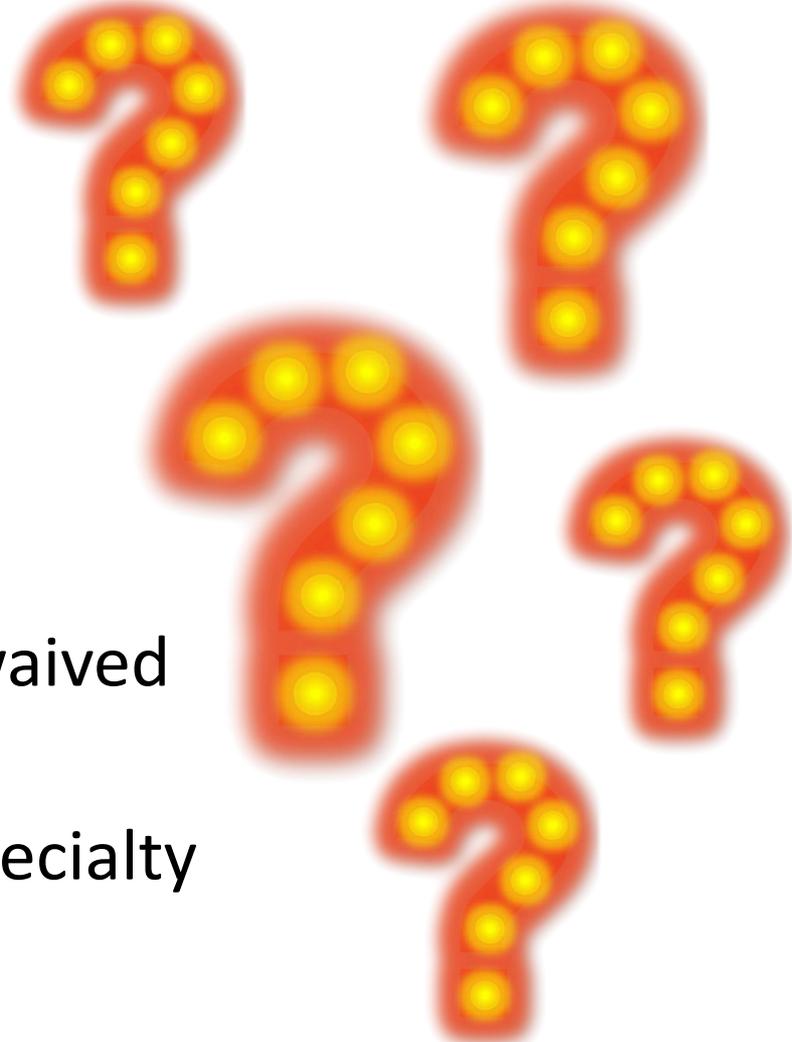


CONTRACTOR SELECTION



TxDOT Prequalification

- Confidential Questionnaire
 - Audited financial statement
 - Completion of questionnaire
- Bidder's Questionnaire
 - Confidential questionnaire waived
 - Smaller projects, routine maintenance, emergency, specialty projects

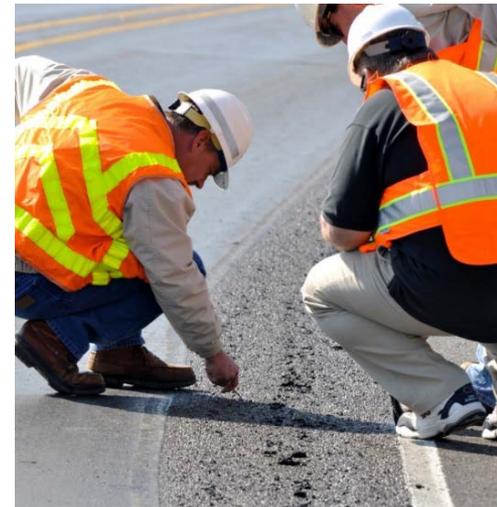


Contractor Selection



Possible Future Considerations

- Quality
- Past performance
- Safety
- Special technical capabilities
- Key personnel



Involvement of Contractor

- Planning and Design Reviews
- Partnering
- Workforce



INVOLVEMENT OF CONTRACTOR

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



INVOLVEMENT OF CONTRACTOR

Partnering

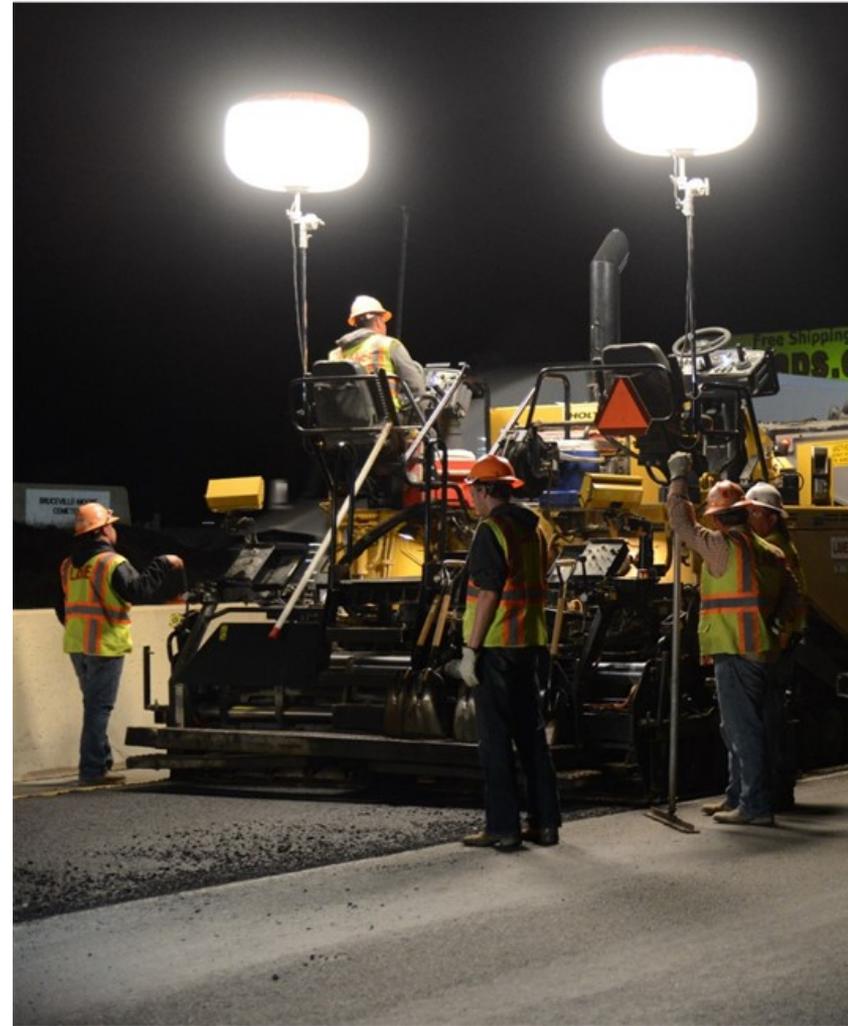
- Agreement to
 - Solve issues at low level in organizations
 - Openness to change as information becomes available
 - Attention to detail
 - Focus on project with unselfish effort
 - Take steps to insure that no interruptions take place
 - Co-locate key personnel on project
 - Empower workforce to make 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



CONSTRUCTION CONSIDERATIONS

General Considerations

- “We Build Texas-Field Guide to Successful Project Delivery”
- Key elements of successful project
 - Safety
 - Money
 - Timeliness
 - Relationships
 - Perception
 - Quality

We Build Texas

*Field Guide to
Successful Project Delivery*



CONSTRUCTION CONSIDERATIONS

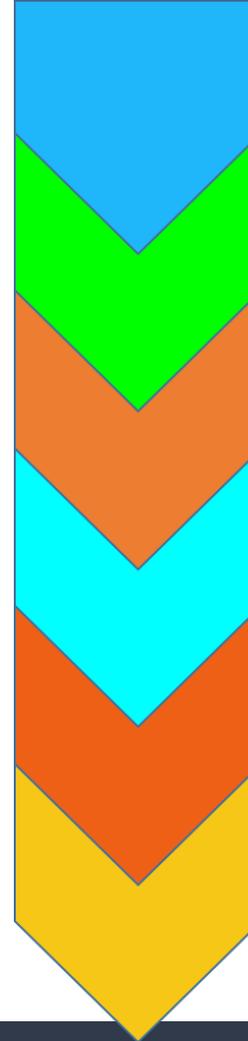
General Considerations

- 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



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November 7, 2017





ACCELERATED BRIDGE CONSTRUCTION IN TEXAS (AND BEYOND)



Accelerated Bridge Construction (ABC) Techniques

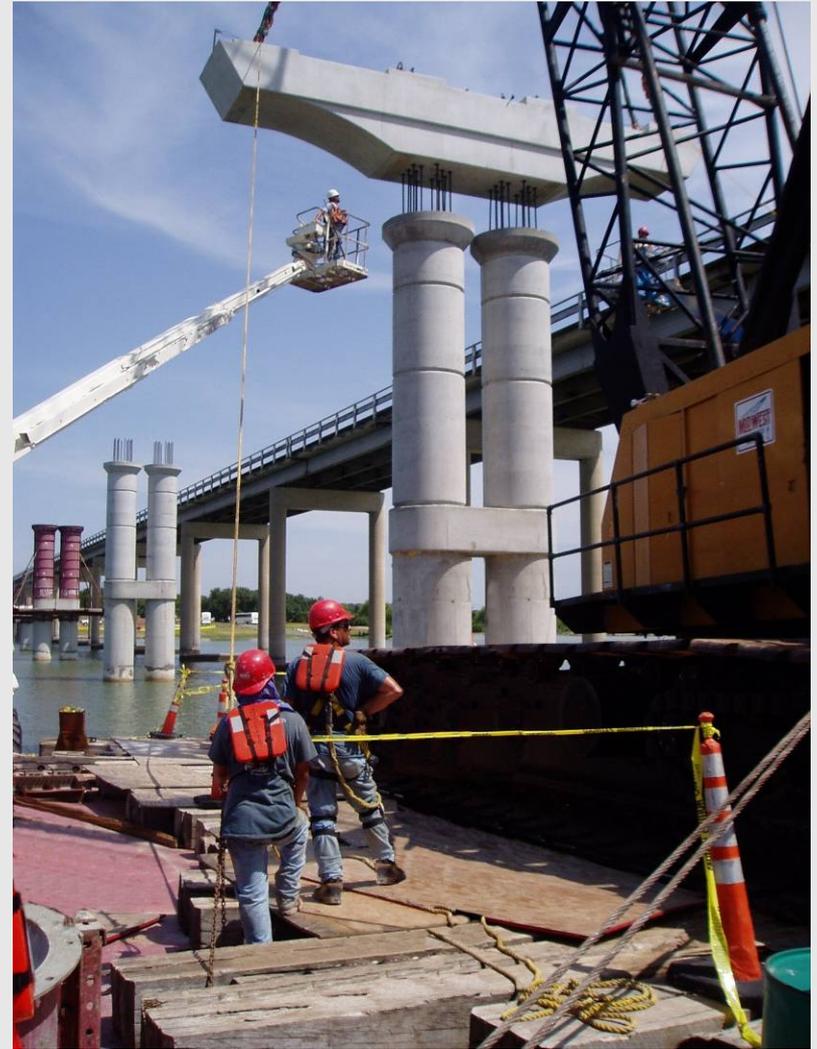
- 1 Prefabricated Elements
- 2 Self Propelled Modular Transporters (SPMTs)
- 3 Modular Units
- 4 Lateral Slide-in Bridge Construction



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 lets talk fast!



Decked Slab Beams



Decked Slab Beams: 6 – 10 Day Construction Projects

FM 1660
Cottonwood Creek
(AUS)

Precast Abutment

Decked Slab Beams

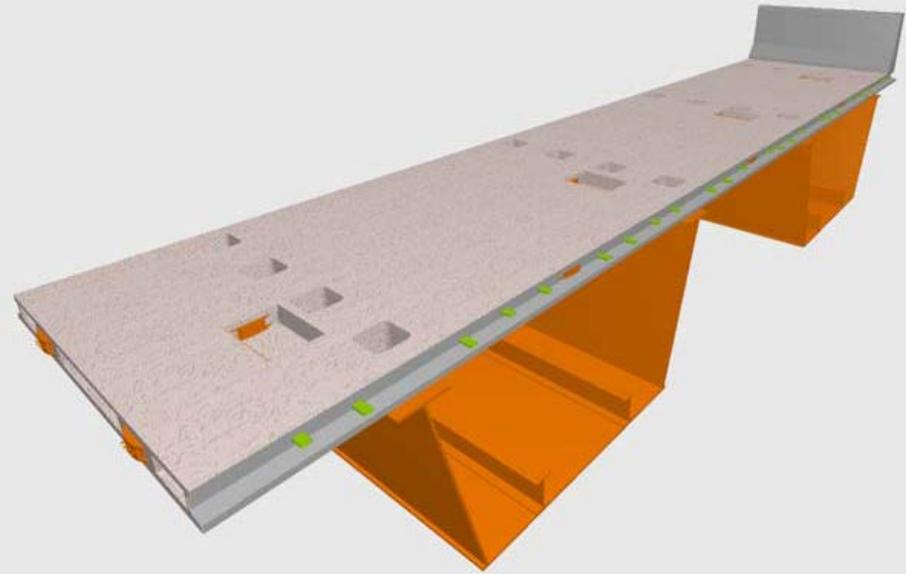
Precast Bent Cap

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



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



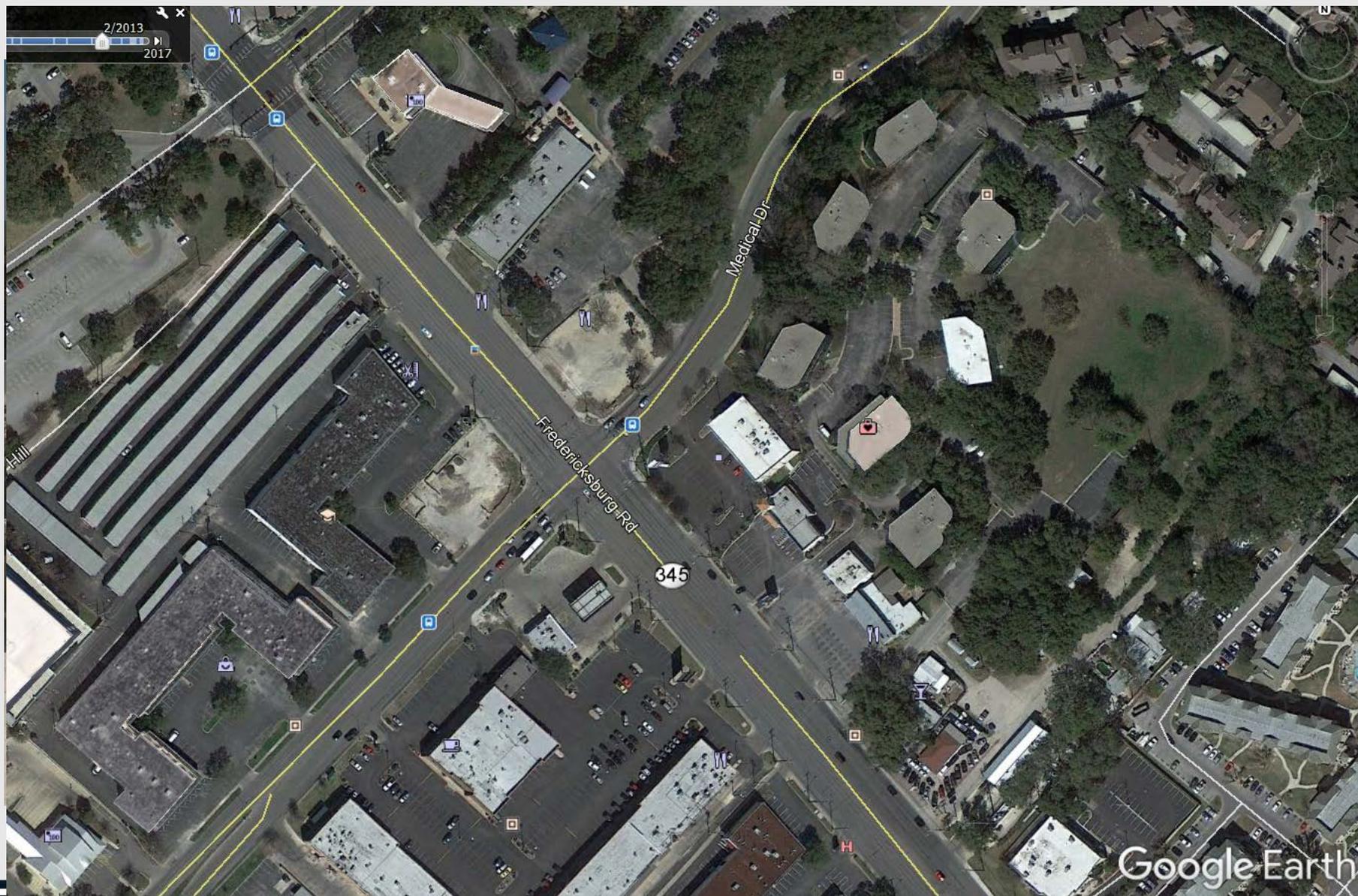
Lateral Slide-in



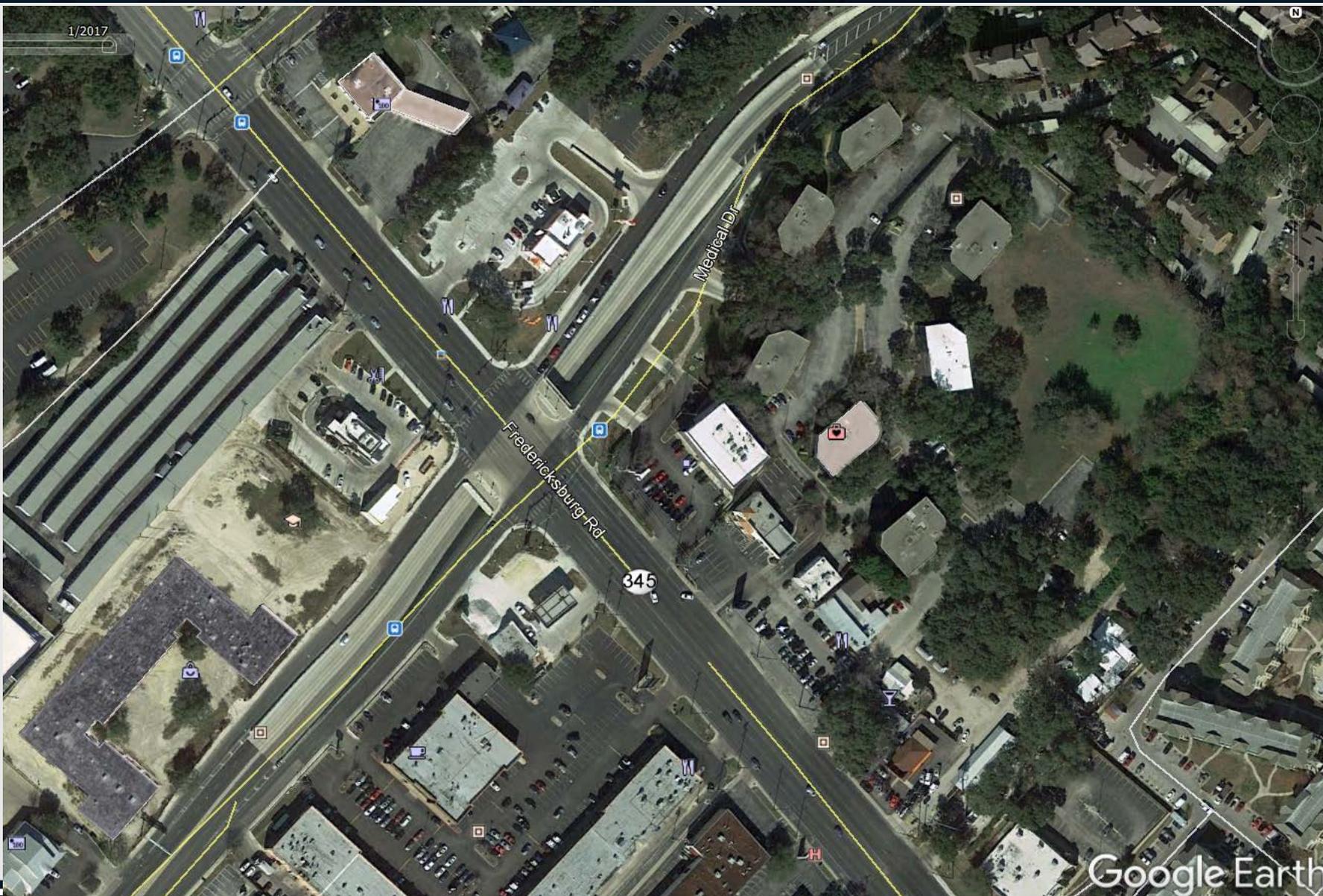
Lateral Slide-in – LP 345 / Fredericksburg Rd (San Antonio)



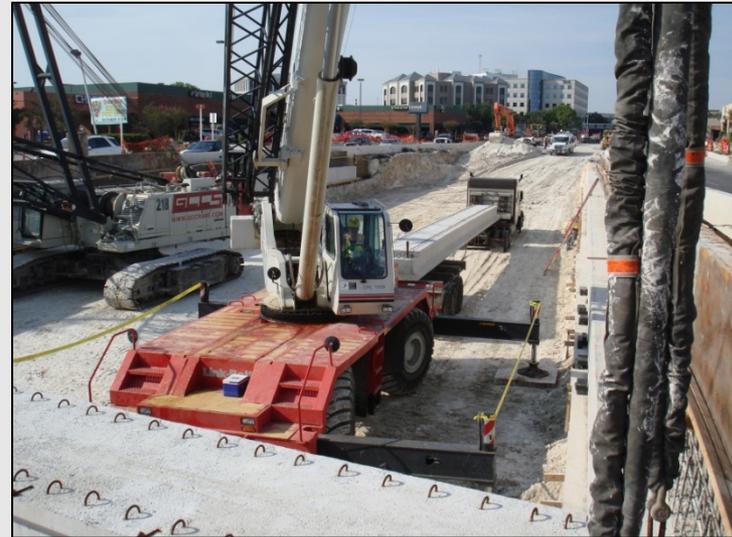
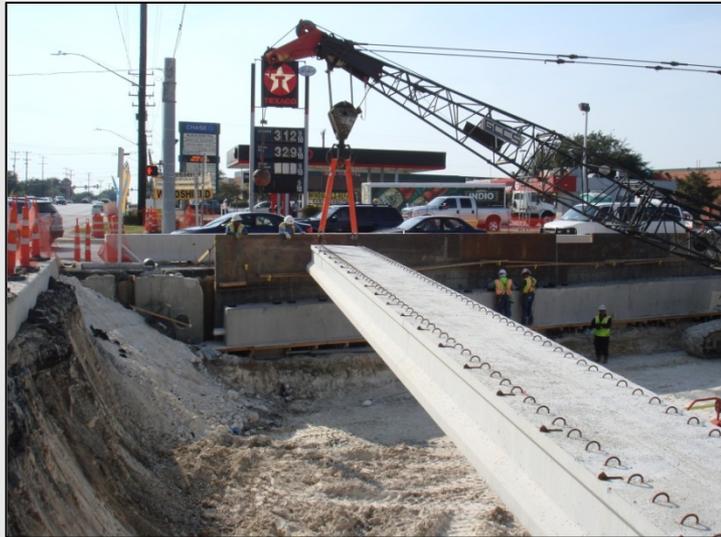
Lateral Slide-in – LP 345 / Fredericksburg Rd (San Antonio)



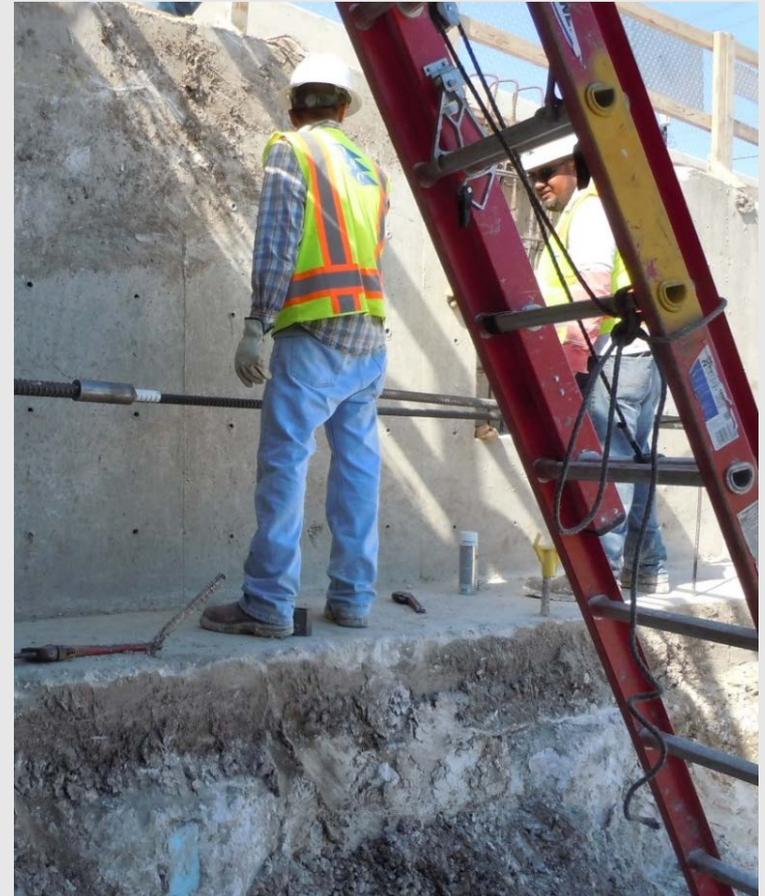
Lateral Slide-in – LP 345 / Fredericksburg Rd (San Antonio)



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 Calculation

ROAD USER COST ANALYSIS FOR 0006-18-050

TRAFFIC DATA FROM STATEWIDE PLANNING MAP	2010	2011	2012	2013	2014		
	10500	9400	9400	10482	10407		

NORMAL ROUTE	DIST (FT)	CHANGED ROUTE	DIST (FT)
IH 20 TO BI-20R via US 84	22400	IH20 TO FM 3438 FM 3438 TO BI-20R	16400 9000

CARS - EACH DIRECTION OF DETOUR

ROUTE	feet	miles	speed (mph)	travel time (hrs)	stopped time (hrs)
IH20 TO FM 3438	16150	3.0587	75	0.0408	
decel	250	0.0473	30	0.0016	
stop					0.0083
accel	250	0.0473	30	0.0016	
FM 3438 TO BI-20R	8500	1.6098	45	0.0358	
decel	250	0.0473	30	0.0016	
stop					0.0083
accel	250	0.0473	30	0.0016	

0.0995 HRS

NORMAL	22400	4.2424	75	0.0566	HRS
---------------	--------------	---------------	-----------	---------------	------------

DELAY TIME/CAR	0.0430	HRS
-----------------------	---------------	------------

NUMBER OF VEHICLES TAKING DETOUR	10400.00
% CARS	74.50
# CARS	7748.00
TIME (ALL CARS)	332.94
COST (ALL CARS)	\$7,234.84

TRUCKS - EACH DIRECTION OF DETOUR

ROUTE	feet	miles	speed (mph)	travel time (hrs)	stopped time (hrs)
IH20 TO FM 3438	16150	3.0587	75	0.0408	
decel	250	0.0473	30	0.0016	
stop					0.0111
accel	250	0.0473	30	0.0016	
FM 3438 TO BI-20R	8500	1.6098	45	0.0358	
decel	250	0.0473	30	0.0016	
stop					0.0111
accel	250	0.0473	30	0.0016	

0.1051 HRS

NORMAL	22400	4.2424	75	0.0566	HRS
---------------	--------------	---------------	-----------	---------------	------------

DELAY TIME/TRUCK	0.0485	HRS
-------------------------	---------------	------------

NUMBER OF VEHICLES TAKING DETOUR	10400.00
% TRUCKS	25.50
# TRUCKS	2652.00
TIME (ALL TRUCKS)	128.69
COST (ALL TRUCKS)	\$4,072.28

TOTAL ROAD USER COST/DAY

11,307.11

CST Determination of Low Bid

Job 3222: CCSJ 0006-18-050 Taylor							
BIDDER	A (bid items)	% O/U	Days Bid	Road User Cost (RUC)	B (days x RUC)	Total A + B	% O/U
ENG ESTIMATE	\$8,008,790.08	-----	317	\$11,307.00	\$3,584,319.00	\$11,593,109.08	-----
Bidder # 1	\$8,999,252.10	12.37%	208	\$11,307.00	\$2,351,856.00	\$11,351,108.10	-2.09%
Bidder # 2	\$10,567,670.56	31.95%	300	\$11,307.00	\$3,392,100.00	\$13,959,770.56	20.41%
Bidder # 3	\$11,265,763.32	40.67%	300	\$11,307.00	\$3,392,100.00	\$14,657,863.32	26.44%

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.

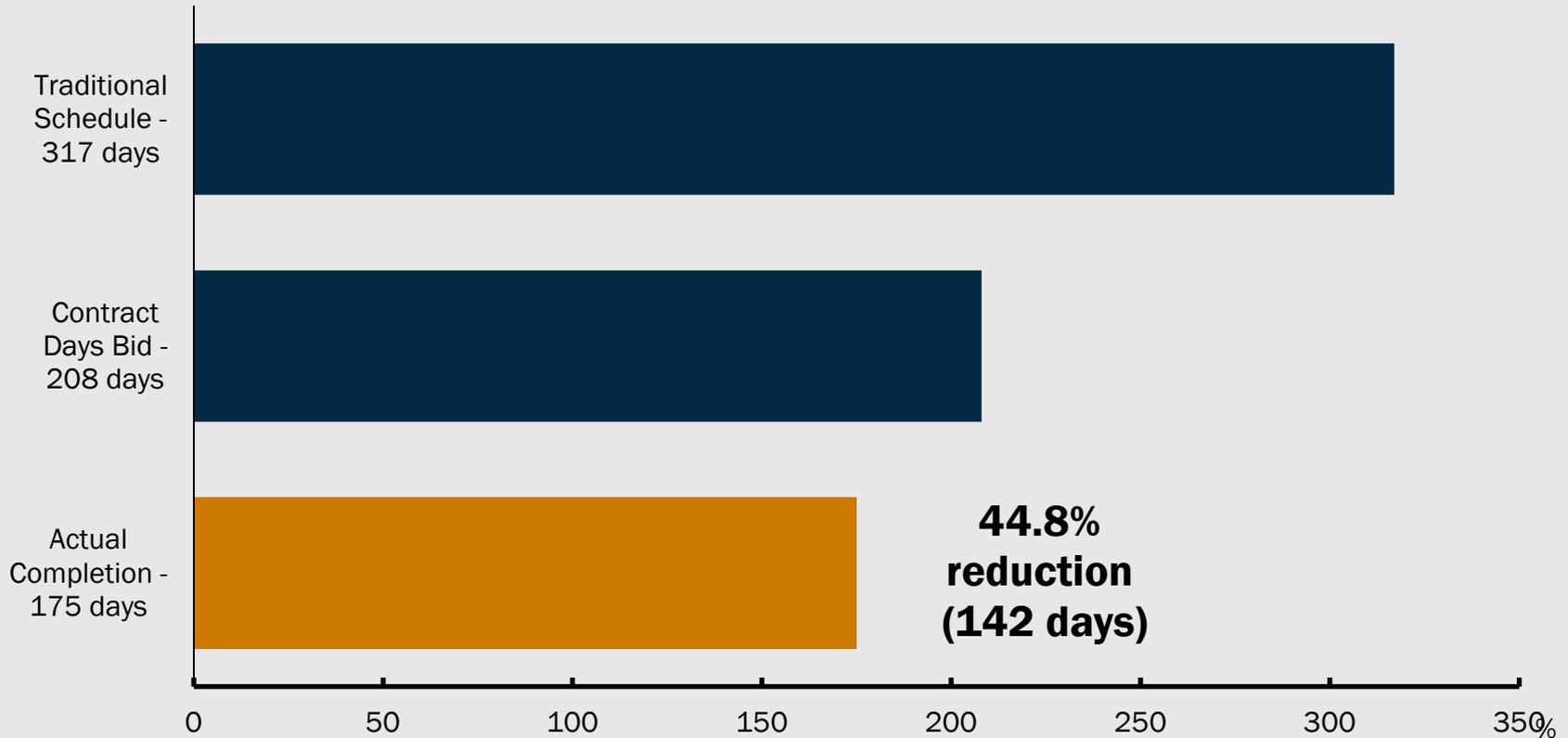
Project Summary

- 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



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



White's
Photography

Looking North at Substantial Completion Date



Looking Northwest at Substantial Completion Date



White's
Photography

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)

Questions ?





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

Bid Days	Working Days Charged
43	41



- Horizontal Alignment
- Vertical Alignment



- TCP Phasing
- Work Space



A+B Bidding / Milestones

Project CSJ	Roadway	Calendar Days Allowed	Bid Days	Incentive Milestones	Max Incentive	Incentive Received
0007-06-086	IH 20	73 - 133	133	RUC Incentive for substantial completion	\$34,890	\$34,890
0007-06-084	IH 20	914 - 1094	914	CALD Incentives for 2 milestones	\$155,400	TBD

Questions

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

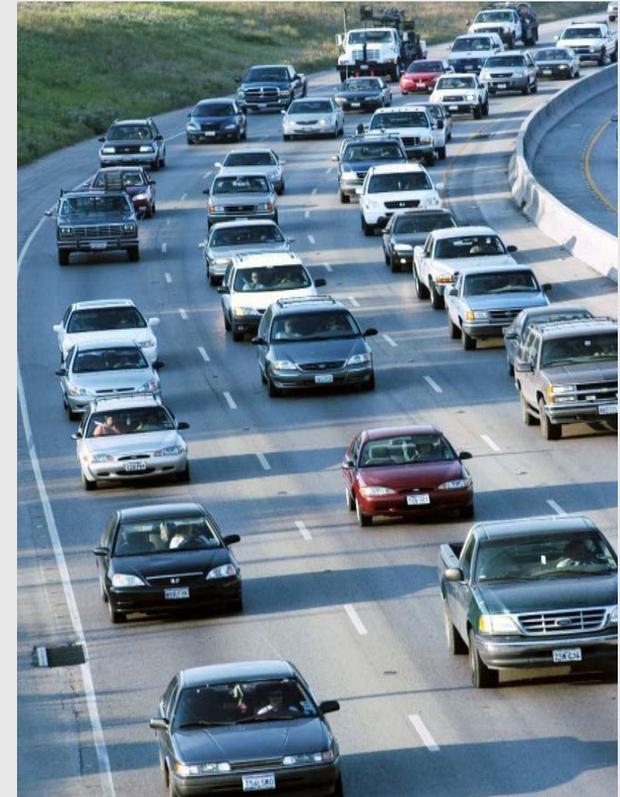




TRAFFIC AND SAFETY

Accelerated Construction Workshop

Paul N. Norman, P.E.





“GET-IN, GET-OUT, STAY-OUT”

Accelerated Construction

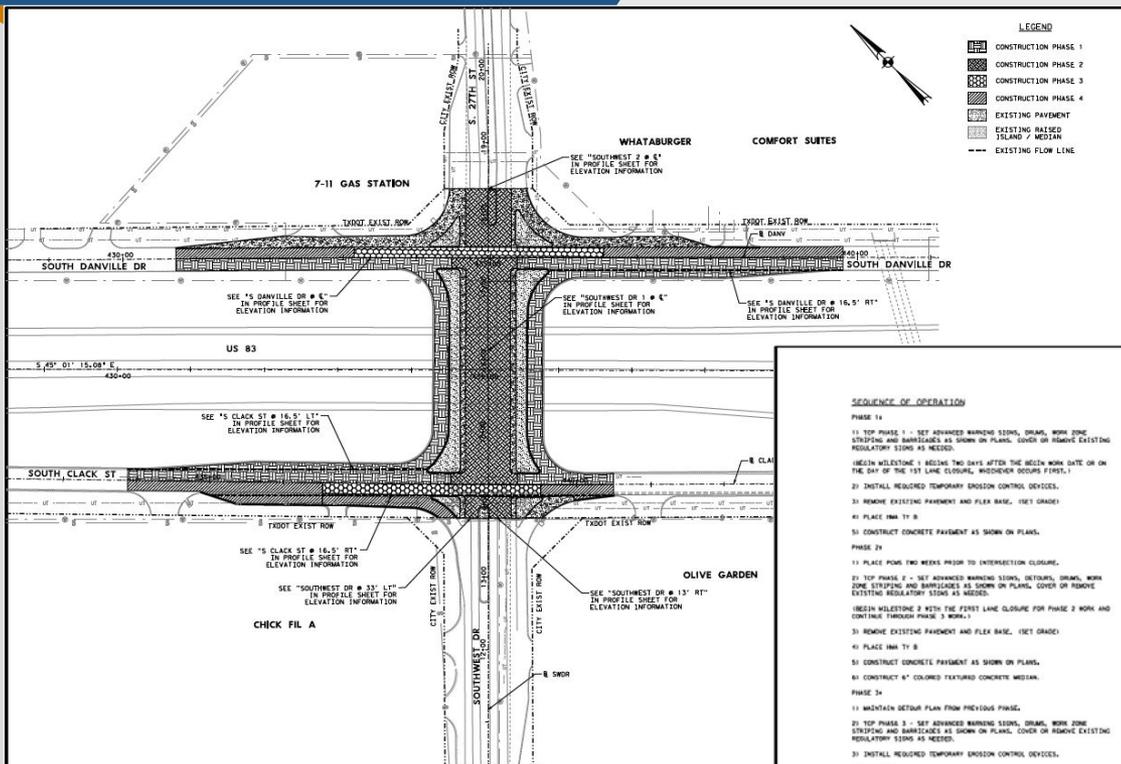
Safety and Traffic

Planning



Safety and Traffic

Design



SEQUENCE OF OPERATION

- PHASE 1A**
- 1) TOP PHASE 1 - SET ADVANCED WARNING SIGNS, SIGMA, WORK ZONE STRIPING AND BARRICADES AS SHOWN ON PLANS. COVER OR REMOVE EXISTING REGULATORY SIGNS AS NEEDED.
 - (MILEN MILESTONE 1 WITH TWO DAYS AFTER THE MILEN WORK DATE OR ON THE DAY OF THE 1ST LANE CLOSURE, WHICHEVER OCCURS FIRST.)
 - 2) INSTALL REQUIRED TEMPORARY EROSION CONTROL DEVICES.
 - 3) REMOVE EXISTING PAVEMENT AND FLEX BASE. (SET GRADE)
 - 4) PLACE INBA 1A TO B
 - 5) CONSTRUCT CONCRETE PAVEMENT AS SHOWN ON PLANS.
- PHASE 2A**
- 1) PLACE POMS TWO WEEKS PRIOR TO INTERSECTION CLOSURE.
 - 2) TOP PHASE 2 - SET ADVANCED WARNING SIGNS, SIGMA, WORK ZONE STRIPING AND BARRICADES AS SHOWN ON PLANS. COVER OR REMOVE EXISTING REGULATORY SIGNS AS NEEDED.
 - (MILEN MILESTONE 1 WITH THE FIRST LANE CLOSURE FOR PHASE 2 WORK AND CONTINUE THROUGH PHASE 3 WORK.)
 - 3) REMOVE EXISTING PAVEMENT AND FLEX BASE. (SET GRADE)
 - 4) PLACE INBA 1A TO B
 - 5) CONSTRUCT CONCRETE PAVEMENT AS SHOWN ON PLANS.
 - 6) CONSTRUCT A" COLORED TEXTURED CONCRETE MEDIUM.
- PHASE 3A**
- 1) MAINTAIN DETOUR PLAN FROM PREVIOUS PHASE.
 - 2) TOP PHASE 3 - SET ADVANCED WARNING SIGNS, SIGMA, WORK ZONE STRIPING AND BARRICADES AS SHOWN ON PLANS. COVER OR REMOVE EXISTING REGULATORY SIGNS AS NEEDED.
 - 3) INSTALL REQUIRED TEMPORARY EROSION CONTROL DEVICES.
 - 4) PREP ROW
 - 5) REMOVE EXISTING PAVEMENT AND FLEX BASE. (SET GRADE)
 - 6) PLACE INBA 1A TO B
 - 7) CONSTRUCT CONCRETE PAVEMENT AS SHOWN ON PLANS.
 - 8) REMOVE DETOUR AND TEMPORARY EROSION CONTROL DEVICES.
- PHASE 4A**
- (END MILESTONE 2 WITH COMPLETION OF PHASE 3 WORK AND ALL SOUTHWEST DRIVE LANES ARE OPEN TO TRAFFIC IN BOTH DIRECTIONS.)
- 1) TOP PHASE 4 - SET ADVANCED WARNING SIGNS, SIGMA, WORK ZONE STRIPING AND BARRICADES AS SHOWN ON PLANS. COVER OR REMOVE EXISTING REGULATORY SIGNS AS NEEDED.
 - 2) PLACE PERMANENT TRAFFIC BUTTONS ON SOUTHWEST DRIVE AND S. 27TH STREET.
 - 3) REMOVE EXISTING PAVEMENT AND FLEX BASE. (SET GRADE)
 - 4) PLACE INBA 1A TO B
 - 5) CONSTRUCT CONCRETE PAVEMENT AS SHOWN ON PLANS.

- (END MILESTONE 1 WITH THE COMPLETION OF ALL PAVEMENT WORK SPECIFIED IN THE CONTRACT AND THE ROADWAY IS OPEN TO TRAFFIC IN ITS FINAL ALIGNMENT AS SHOWN ON THE PLANS FOR THE FINISHED ROADWAY UTILIZING WORK ZONE PAVEMENT MARKINGS.)
- 6) INSTALL PERMANENT STRIPING & REPLACE SMALL SIGN ASSEMBLIES.
 - 7) REMOVE TRAFFIC DEVICES.
 - 8) CLEAN UP

GENERAL NOTES

1. INSTALL ALL SIGNS, BARRICADES AND TRAFFIC CONTROL DEVICES AS SHOWN AND IN ACCORDANCE WITH THE STANDARD SHEETS AND AS DIRECTED BY ENGINEER.
2. ADDITIONAL SIGNS, BARRICADES OR TRAFFIC CONTROL DEVICES OTHER THAN THOSE SPECIFIED MAY BE REQUIRED FOR THE SAFE MOVEMENT OF TRAFFIC THROUGH THE PROJECT. PAYMENT FOR ALL SUCH SIGNS, BARRICADES OR TRAFFIC CONTROL DEVICES WILL BE CONSIDERED AS SUBSIDIARY TO THE ITEM "BARRICADES, SIGNS AND TRAFFIC MARKING".
3. WORK LAYOUTS WILL BE CAREFULLY MAINTAINED TO INSURE THAT TRAFFIC CONTROL MEASURES ARE OPERATING EFFECTIVELY AND THAT ALL DEVICES USED ARE CLEARLY VISIBLE, CLEAN AND IN GOOD REPAIR.
4. THE CONTRACTOR WILL PROVIDE SAFE ACCESS TO AND FROM ALL PRIVATE PROPERTY AT ALL TIMES AND IN ALL WEATHER CONDITIONS.
5. THE CONTRACTOR WILL BE REQUIRED TO SUBMIT A DETAILED SCHEDULE OF WORK TO THE PROJECT ENGINEER PRIOR TO THE BEGINNING OF CONSTRUCTION WHICH GENERALLY CONFORMS TO THE SEQUENCE SHOWN ON THE TOP SEQUENCE OF OPERATION.
6. COMPLETE ALL WORK ON PROJECT AS SHOWN ON THE VARIOUS PLAN SHEETS AND IN COMPLIANCE WITH THE GENERAL NOTES OF THIS CONTRACT.
7. ANY REQUEST TO ALTER THE SEQUENCE OF OPERATION OR TRAFFIC CONTROL PLAN WILL BE SUBMITTED TO THE ENGINEER FOR WRITTEN APPROVAL.
8. CONTRACTOR SHALL PUT UP PORTABLE CHANGEABLE MESSAGE SIGNS (POMS) ON ROAD TWO WEEKS PRIOR TO EACH ROAD CLOSURE TO INFORM THE PUBLIC OF THE DATE AND TIME OF ROAD CLOSURE FOR SOUTHWEST DRIVE 27TH ST.
9. CONTRACTOR SHALL COORDINATE WITH THE ENGINEER TO MAINTAIN AND ADJUST TRAFFIC SIGNAL TIMING SEQUENCES AS SHOWN ON THE PLANS FOR THE DIFFERENT PHASES AND SPACES.
10. SEE SPECIAL CONSTRUCTION MARKING SIGN SIZE AND SPACING CHART IN THE BC STANDARD AND TRAFFIC FOR SIGN SIZE REQUIREMENTS.
11. SEE TOP STANDARDS FOR CHANNELIZING DEVICES SPACING
12. WATER BLASTING METHOD WILL BE USED TO REMOVE EXISTING PAVEMENT MARKINGS, INCLUDING WORK ZONE PAVEMENT MARKINGS UNLESS OTHER METHOD APPROVED BY ENGINEER.



NO.	DATE	REVISION	APPROVAL

RPS klotz associates
 1300 Ross Avenue, Suite 500 Houston, Texas 77006
 P: 281.591.2277 • email:rklotz@rpsklotz.com • www.rpsklotz.com

Texas Department of Transportation
 601 West Loop West
 SUITE 800
 HOUSTON, TEXAS 77006

US 83
 TRAFFIC CONTROL PLAN
 SEQUENCING

SHEET 1 OF 1

DATE	DATE	DATE	DATE

SEE TITLE SHEET

NAME	DATE

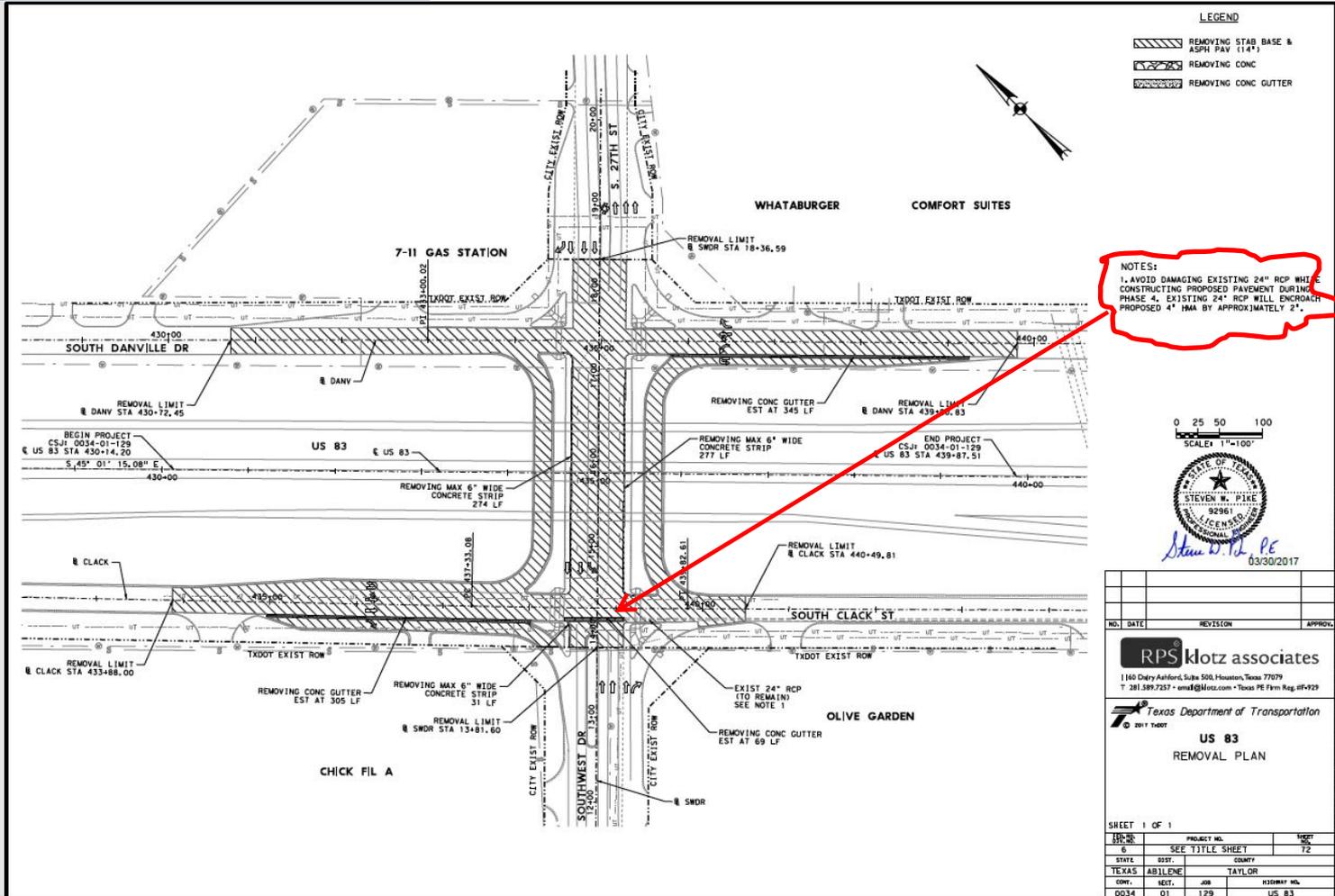
SCALE: AS SHOWN

Design



Safety and Traffic

Design



Contracting

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

Implementation



Implementation



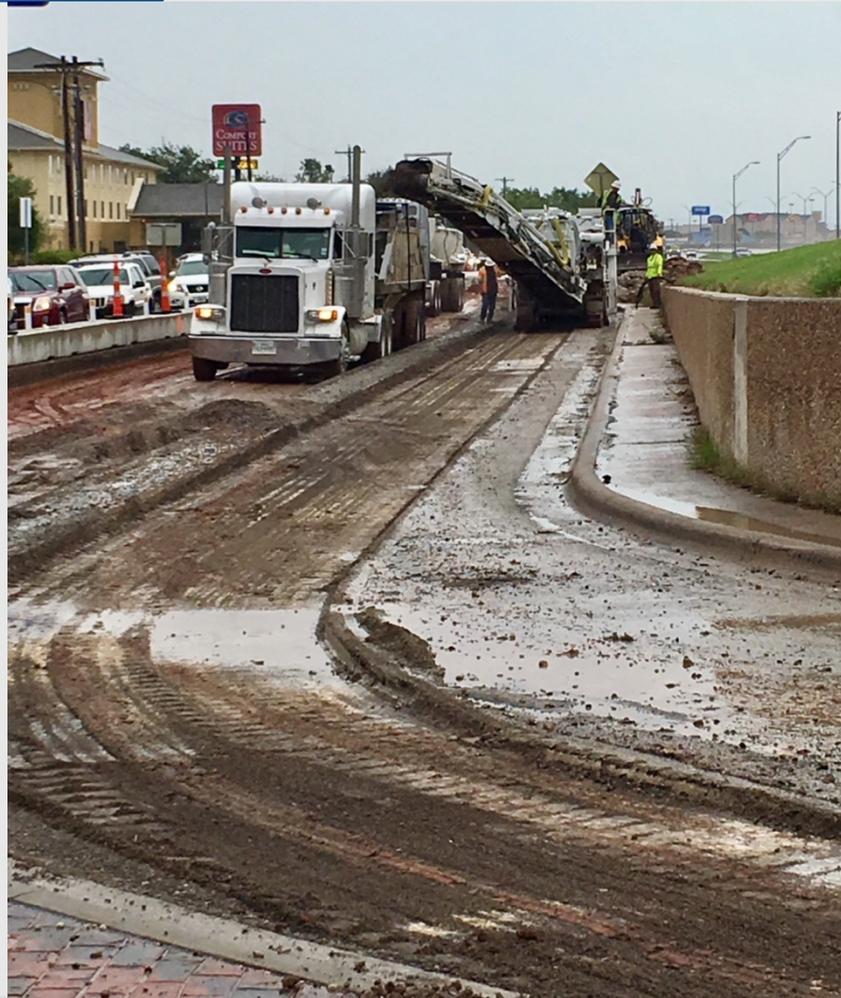
Implementation



Evaluation



Evaluation



Evaluation



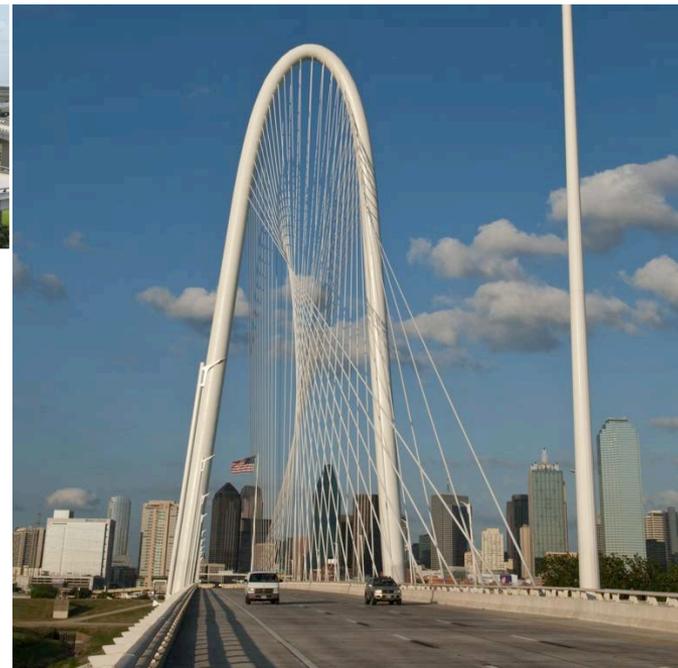
Questions?



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



Lead found on park playground equipment

Chemical analysis shows presence of unacceptable levels of lead dust

Debbie Cooper Kistler
The Junction Eagle

face of the rubberized material beneath the playground equipment, the test showed there were 843.5 ug/cm² present. On the nearby picnic table, lead levels were 765.5 ug/cm² and there were 57.5 ug/cm² found on a nearby bench. Remember, the acceptable level is less than 1.

According to the South Llano River State Park, an official weather station affiliated with the U.S. Weather Service, the area tested had received one inch of rain the day before, on June 17. Presumably, the rain should have washed the dust off of the playground equipment.



The county park's west end playground and picnic area are able levels of lead particulate and remain off limits while the bridge refurbishing company wrangle over remediation response.

Crenweige explained that the bridge company's employees have gone to local motels during lunch or after work, have gone to their motel rooms without being decontaminated and have likely washed their lead dust covered clothing in local laundromats.

When Debbie Kistler, editor of The Junction Eagle, spent time at the playground last

said TBP's decontamination trailer has never been at the job site. Its "decon" trailer has been parked in the leased storage yard. Although it has a water hose running into it, there is no method for collecting any water nor material draining out of it. (See photo on page 14.)

Bridge refurbishing project worsens

Debbie Cooper Kistler
The Junction Eagle

In addition to the of myriad problems involved with getting and keeping the bridge refurbishing project moving forward, now the Texas Commission on Environmental Quality (TCEQ) has entered the scene. Not only have they recently visited the site, but they have also issued a cease and desist order.

According to Crenweige, after the hazardous waste containment system, which was constructed around the spans of the bridge where the abrasive blasting was being done, failed to withstand the wind and rain storms of April May 2 and 4, TxDOT TBP that the spilled material need to be

AM ON MONDAY, MAY 29, 8 A.M. AT JUNCTION CEMETERY

Bridge refurbishing project grinds to a halt

Containment of hazardous waste problems raise questions about contamination around bridge

Debbie Cooper Kistler
The Junction Eagle

The Texas Department of Transportation's South Llano River Bridge refurbishing project appears to have gone from slow to potentially dangerous, and now to a stand still. Its immediate future and date of completion are currently anybody's guess.



Just when the South Llano River Bridge refurbishing project can't get any further, it's back to square one. One of the major problems with the job is the weather. When it rains, the dust is washed away, and I wasn't

The Junction Eagle, Wednesday, September 12, 2007

TxDOT removes giant pecans for better view?

Debbie Cooper Kistler
The Junction Eagle

The view coming into Junction over the South Llano River Bridge was changed last week to include an unattractive tin building, several electrical poles and cables that once served the Lazy Daze 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.

lighting. Another reason offered was that it was necessary to remove the trees so that the rock "rip rap" on the west shoulder is visible. These rocks apparently have historical significance and now it is possible to see these rocks, as well as the tree stumps sticking up here and there among them.

A new explanation was presented on Monday. The reason for the removal of the giant pecans is now that the temporary signal lights to be

Repainting the Historic Truss Bridge in Kimble County



Completed Truss Bridge in Kimble County



BU 67 – Sherwood Way Project - San Angelo

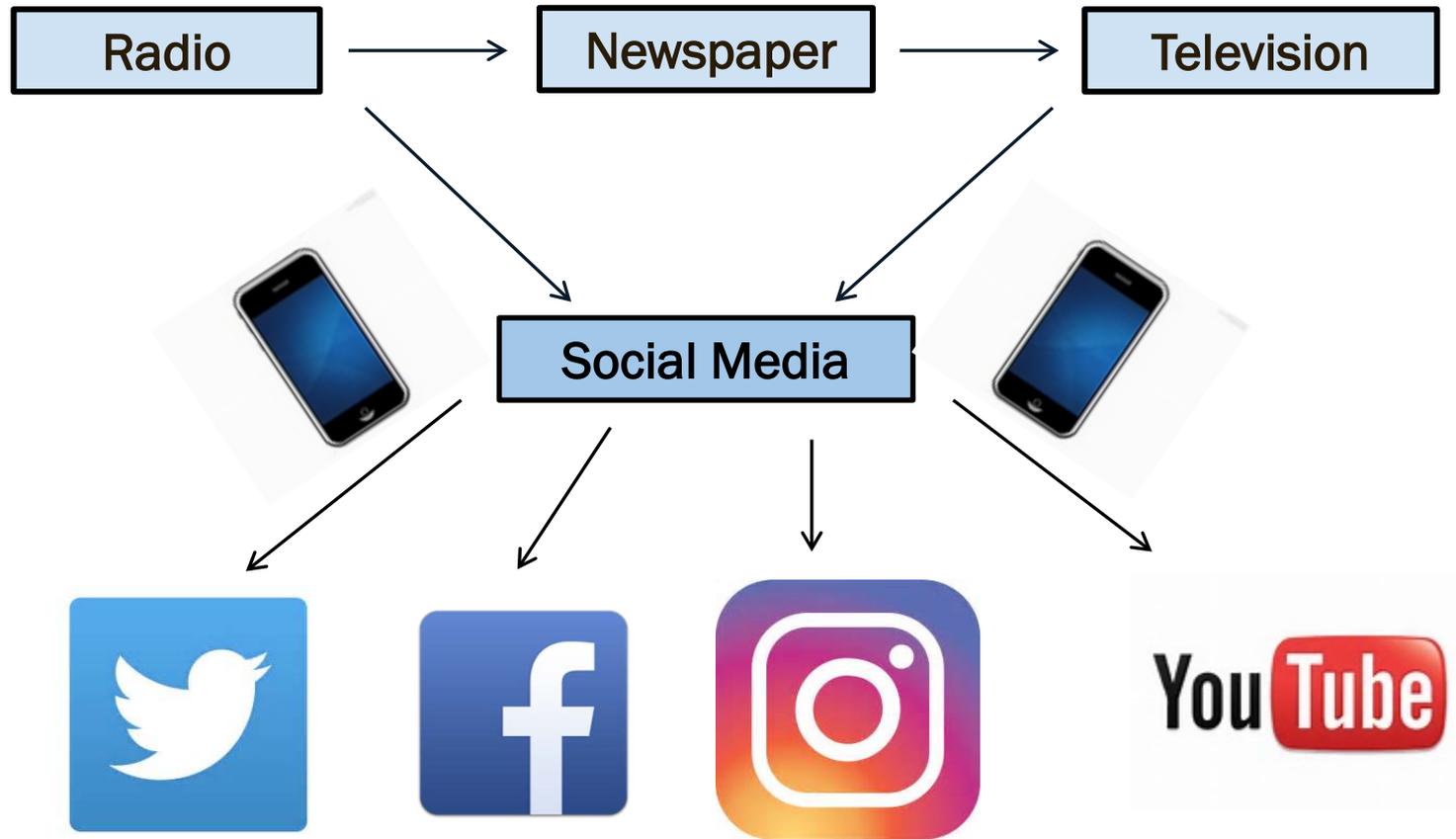


BU 67 Sherwood Way Project San Angelo

- PIO and Assistant Area Engineer met with local businesses prior to construction ✓
- Email updates ✓
- News Media interviews ✓
- Stakeholder meetings ✓



How we've evolved...



Hurricane Harvey Social Media

The image is a screenshot of a web browser displaying a Twitter post. The browser's address bar shows the URL <https://twitter.com/TxDOTSanAngelo/status/901089554387566592>. The Twitter interface includes navigation tabs for Home, Moments, Notifications, and Messages. The tweet is from the account **TxDOT San Angelo** (@TxDOTSanAngelo). The text of the tweet reads: "We've deployed 17 personnel and 12 pieces of equipment this morning to San Antonio for Hurricane Harvey recovery." Below the text is a video player showing a white flatbed truck carrying a yellow front loader. The video has a play button overlay and a duration of 0:00. The tweet is dated "8:31 AM - 25 Aug 2017" and has received 52 Retweets and 85 Likes. The interaction bar at the bottom shows 5 replies, 52 retweets, and 85 likes.

TxDOT San Angelo
@TxDOTSanAngelo

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

0:00

8:31 AM - 25 Aug 2017

52 Retweets 85 Likes

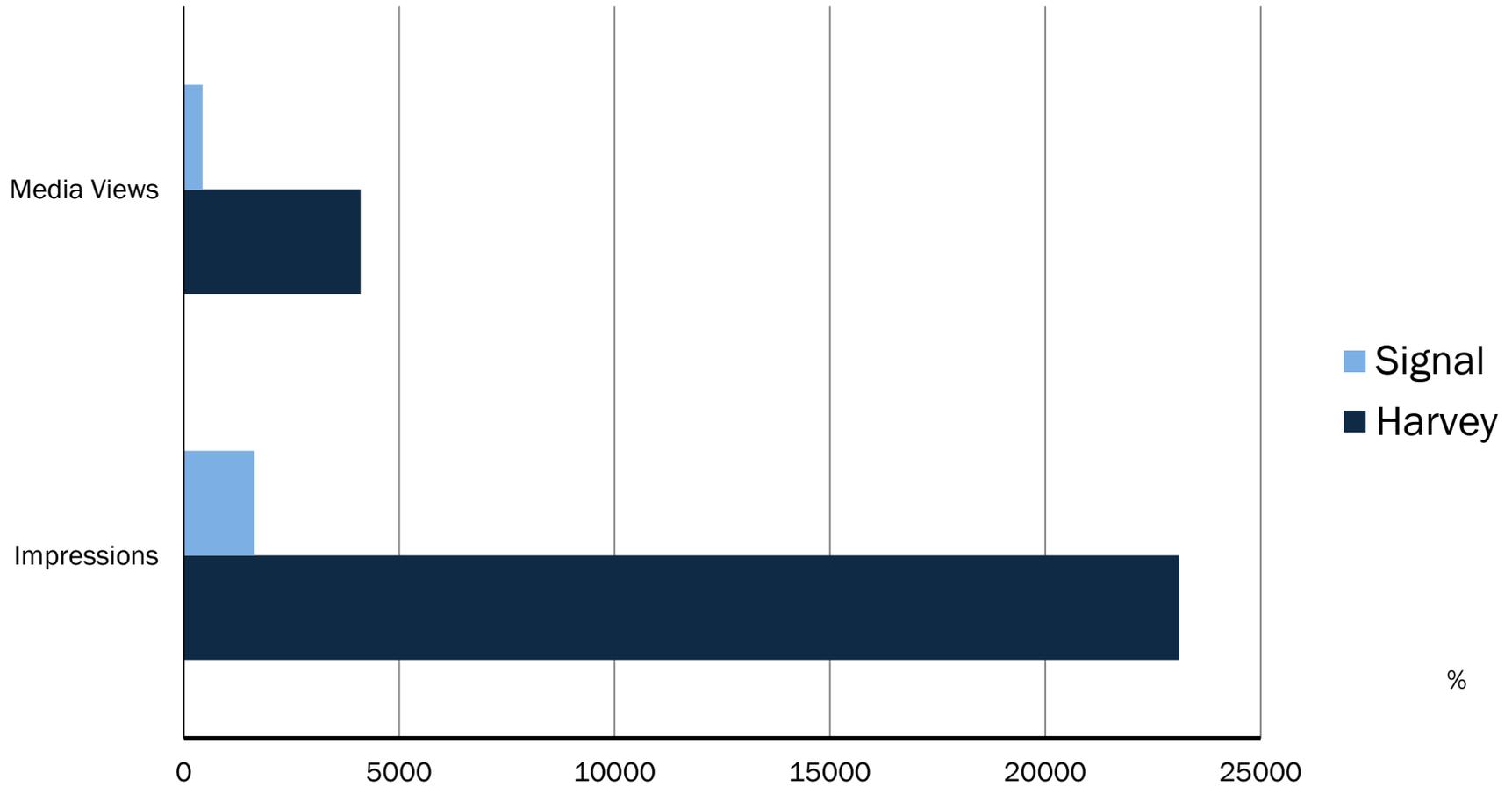
5 52 85

Project Social Media

The screenshot shows a web browser window displaying a Twitter post. The browser's address bar shows the URL: <https://twitter.com/TxDOTSanAngelo/status/912404948633124864>. The Twitter interface includes a navigation bar with 'Home', 'Moments', 'Notifications', and 'Messages'. The tweet is from 'TxDOT San Angelo' (@TxDOTSanAngelo) and contains the text: 'No more flashing yellow! The new traffic signal on Sherwood Way will be fully functioning tomorrow!'. Below the text is a video player showing a road view with a play button and a '0:00' timer. The tweet has '7 Retweets' and '15 Likes'. The Windows taskbar at the bottom shows icons for various applications like Internet Explorer, File Explorer, Chrome, and Office. The system tray on the right shows the time as 3:15 PM on 10/27/2017.

Comparing Two Events

Twitter Analytics



Facebook as a Tool

The screenshot shows a web browser window displaying a Facebook search results page for the group 'Real County'. The browser's address bar shows the URL: <https://www.facebook.com/groups/823187954407986/search/?query=TxDOT>. The browser's taskbar at the top lists several open applications, including 'Most Visited', 'Twitter', 'Bitly', 'HootSuite', '7 Day Forecast for San...', 'Employee Self-Portal', 'TxDOT', 'OWA - Outlook Web ...', and 'TxDOT's Crossroads'.

The Facebook interface includes a search bar at the top with the text 'Real County' and a magnifying glass icon. Below the search bar, there are navigation options: 'Home', 'Find Friends', and a profile picture of 'Karen'. The left sidebar contains navigation links for 'Videos', 'Photos', 'Files', and 'Recommendations', along with a search filter for 'TxDOT' and a 'Filter Results' section. The 'Filter Results' section includes 'SORT BY' options (Top Posts, Most Recent) and 'POSTED BY' options (Anyone, You, Your Friends, Choose a Source...). There is also a 'TAGGED LOCATION' section with 'Anywhere' and 'Choose a Location...' options, and a 'DATE POSTED' section with 'Any date' and '2017' options.

The main content area displays three posts from the 'Real County' group:

- Bruce Carr** (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." (9 likes, 2 comments)
- 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" (13 likes, 6 comments)
- James Couvillon** (April 4 at 9:26am): "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" (7 likes, 6 comments)

On the right side, there are group recommendations:

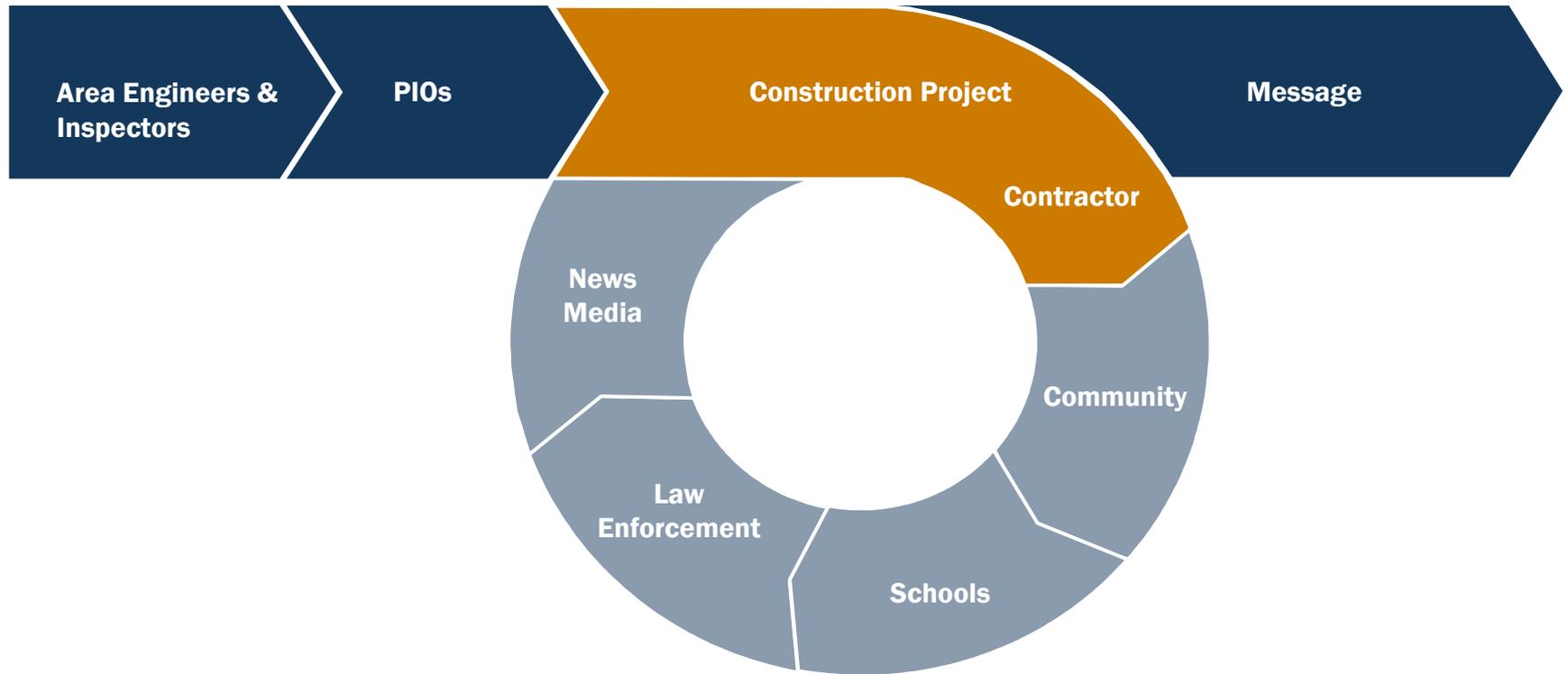
- Nueces Canyon Online Yard Sale** (1,780 members) with a '+ Join' button.
- Real County Centennial Celebration** (471 members) with a '+ Join' button.

Below the recommendations is a 'Friend Requests' section with a 'See All' link. It shows two requests:

- Ann Maxwell**: George Herrmann is a mutual friend. [Confirm Friend]
- Patty Jones**: 3 mutual friends. [Confirm Friend]

At the bottom right, there is a language selection menu with options: English (US) - Español, Português (Brasil) - Français (France), and Deutsch. A '+ Chat' button is also visible.

Life Cycle of a Successful Project



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

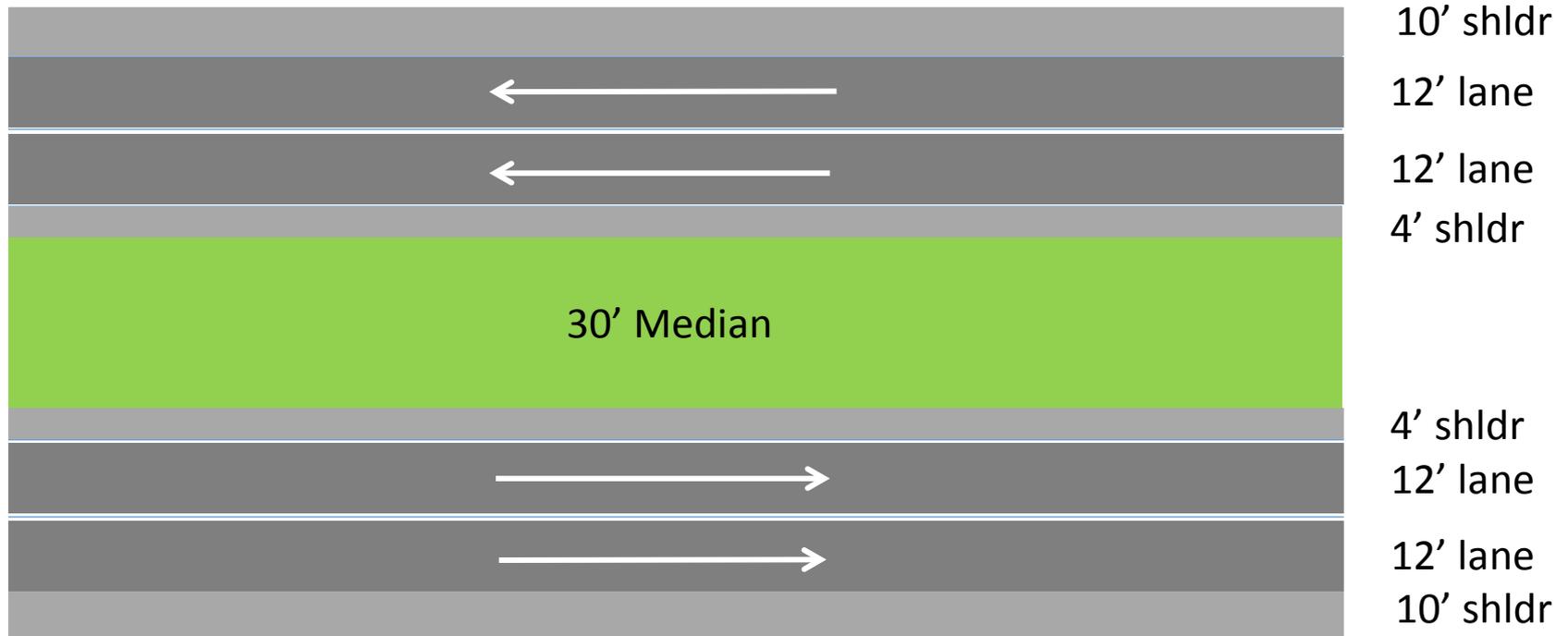


Breakout Groups



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

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

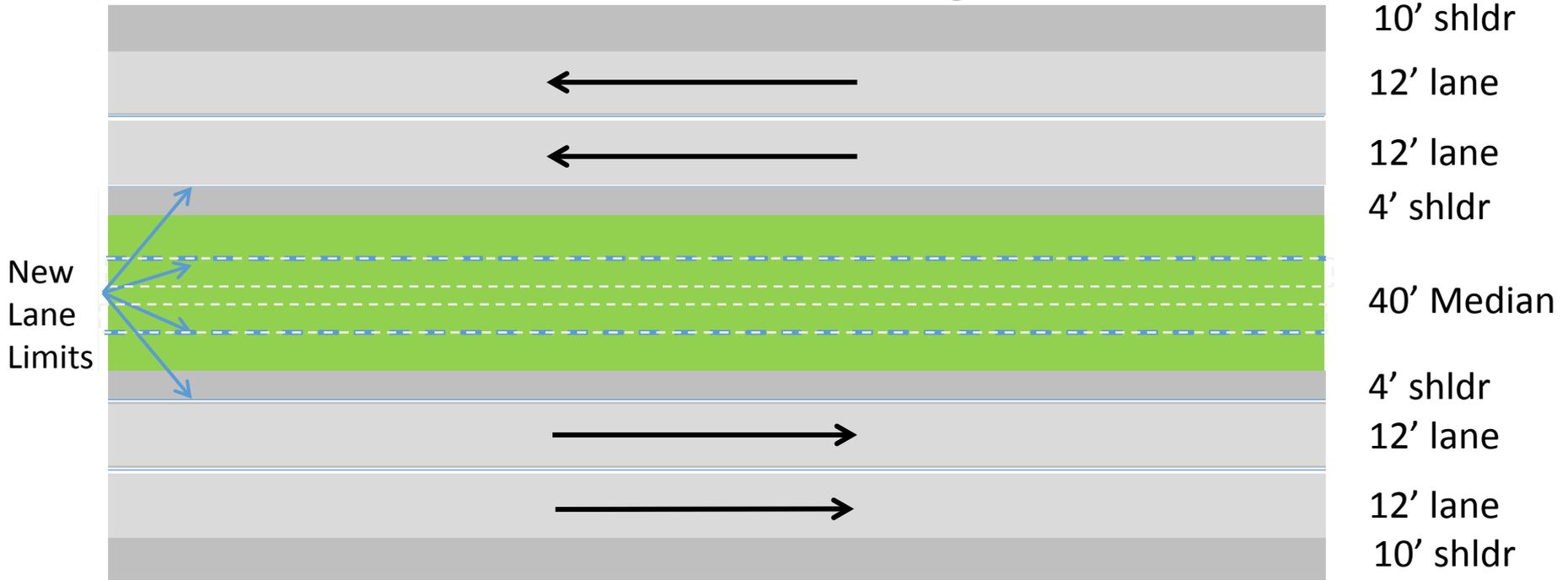
Geometric Design: High speed freeway design

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

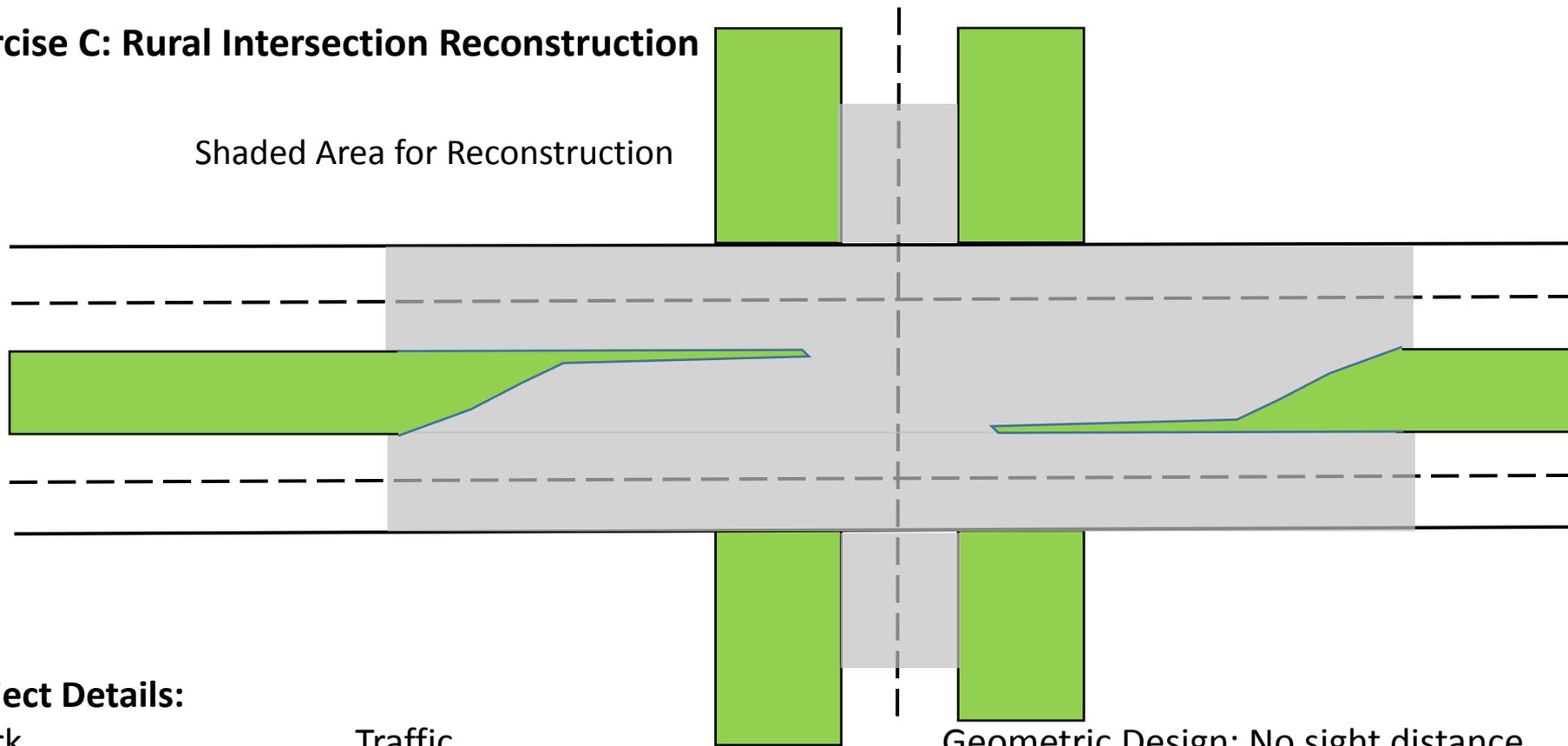
Geometric Design: High speed freeway design

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



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

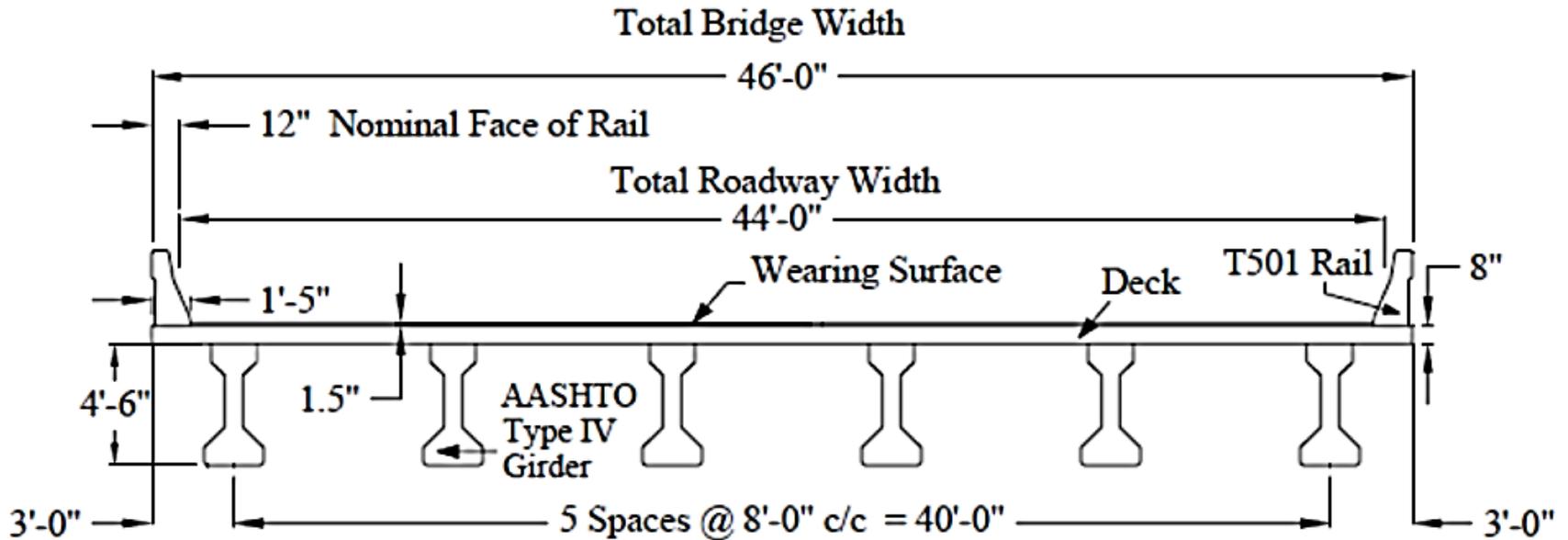
Geometric Design: No sight distance
problem

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



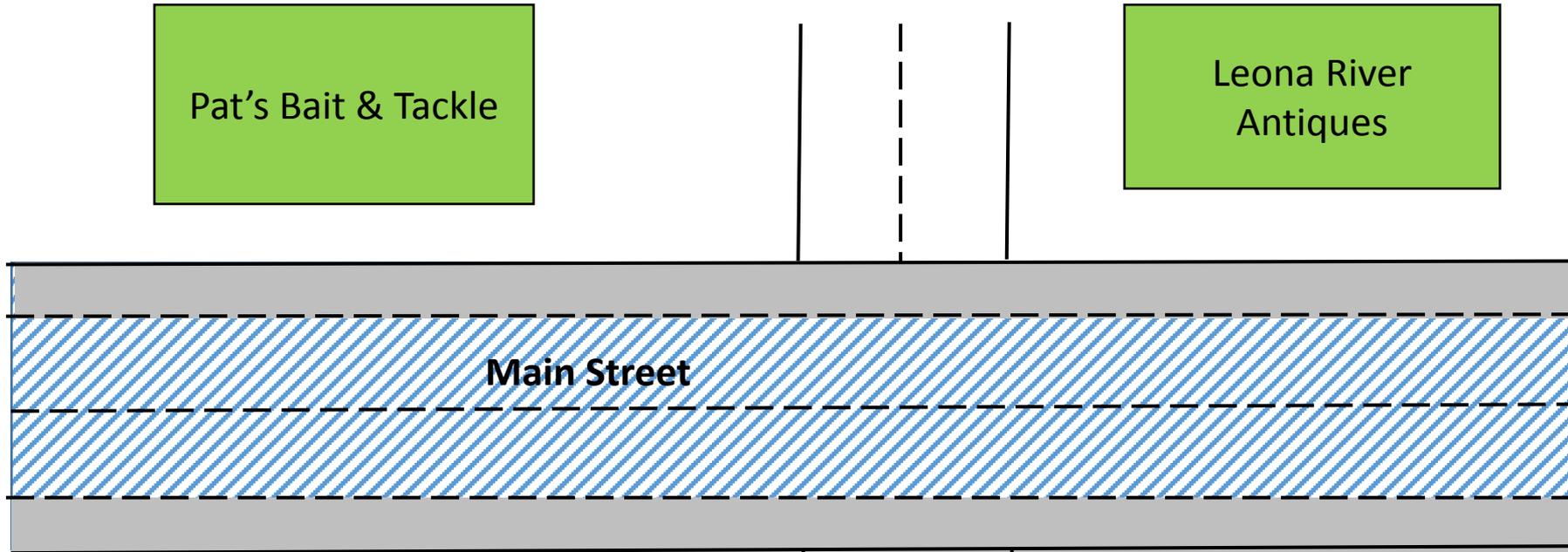
Project Details

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

 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.)

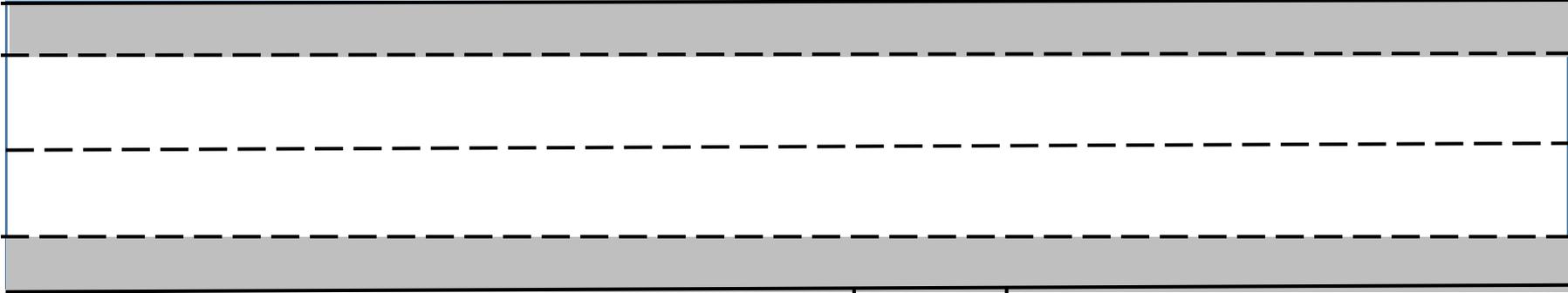
Geometric Design: Tangent section, 10 cross roads

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

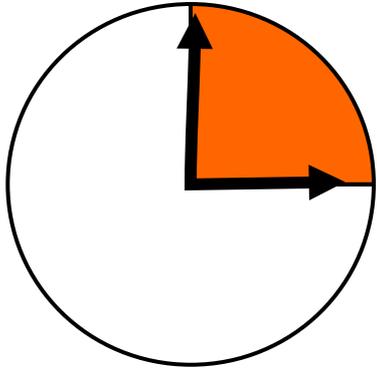
Items to Consider



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

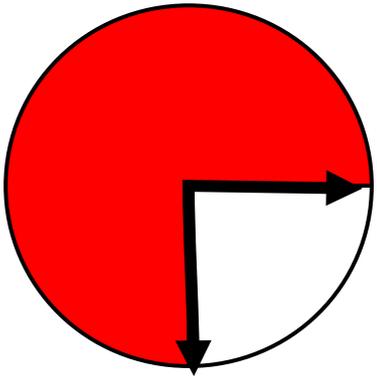


Suggested Time Utilization



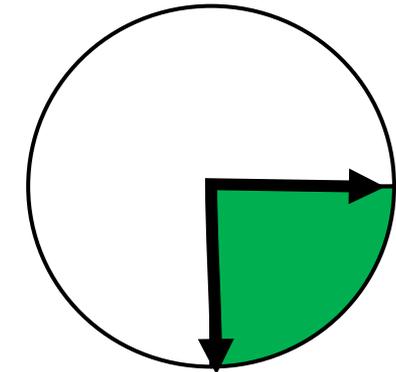
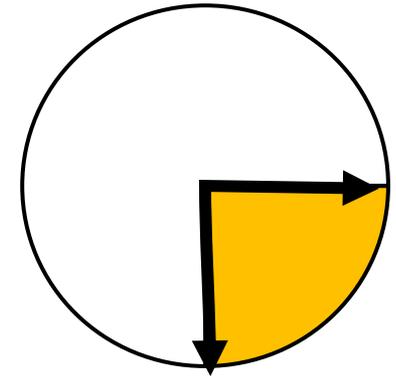
- General project discussion – 15 min

- Items to consider – 15 min



- Top five challenges – 45 min

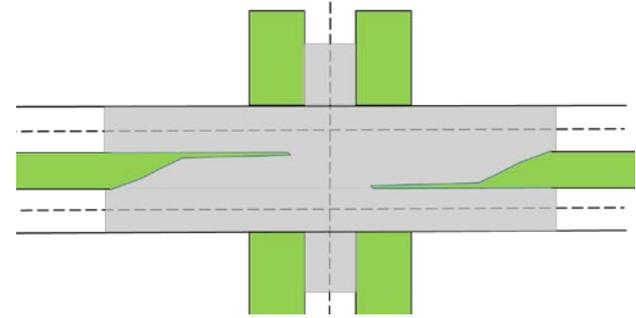
- Information needs – 15 min



Facilitator Report



- Briefly describe project
- Top 5 challenges
- Information needs



1. _____
2. _____
3. _____
4. _____
5. _____



District Workshops on Accelerated Construction



Abilene
MCM Elegante Suites
November 7, 2017



District Workshops on Accelerated Construction Workshop Summary

AC-PP-17-14
Jon Epps

Abilene

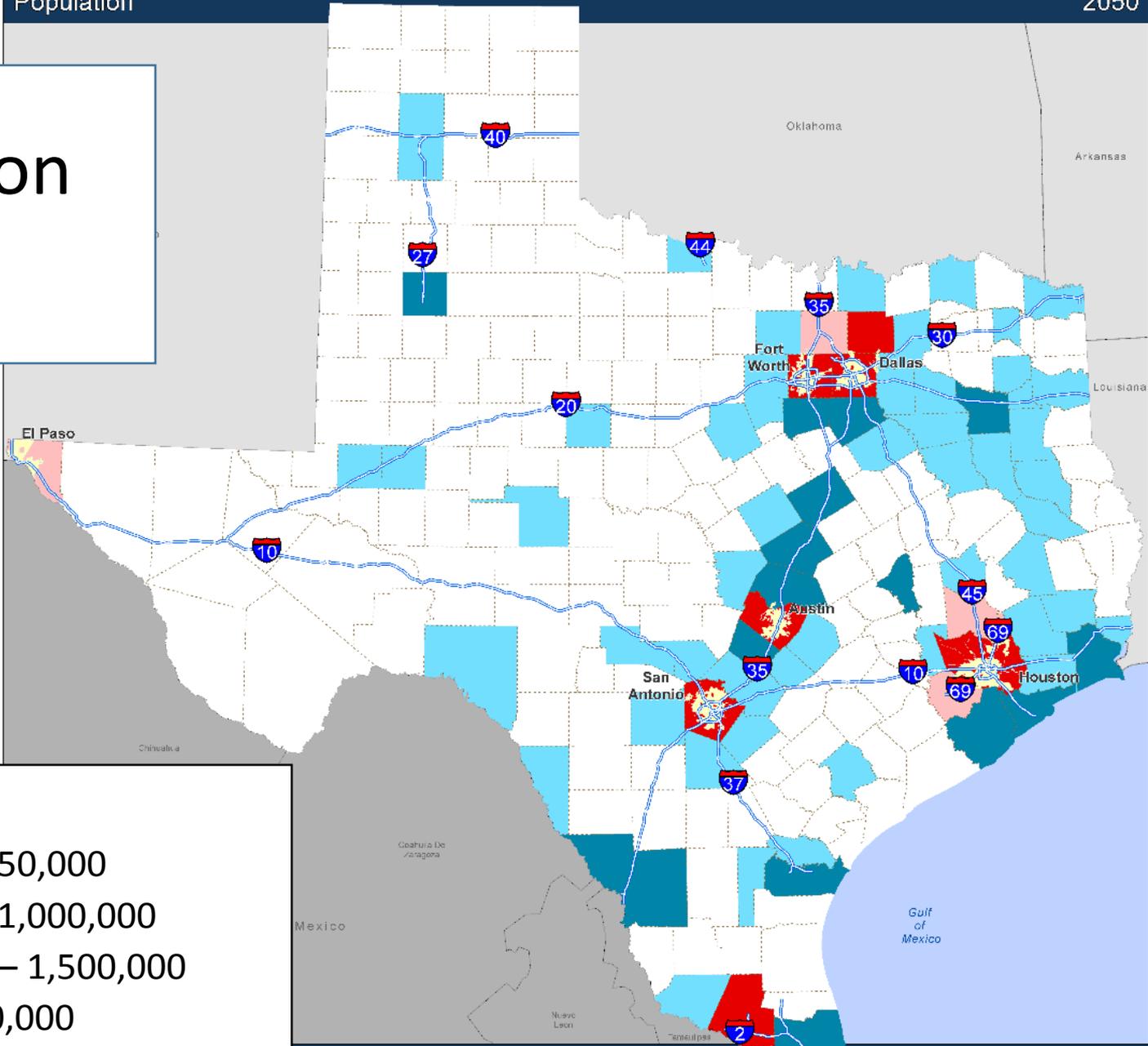
MCM Elegante Suites

November 7, 2017

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

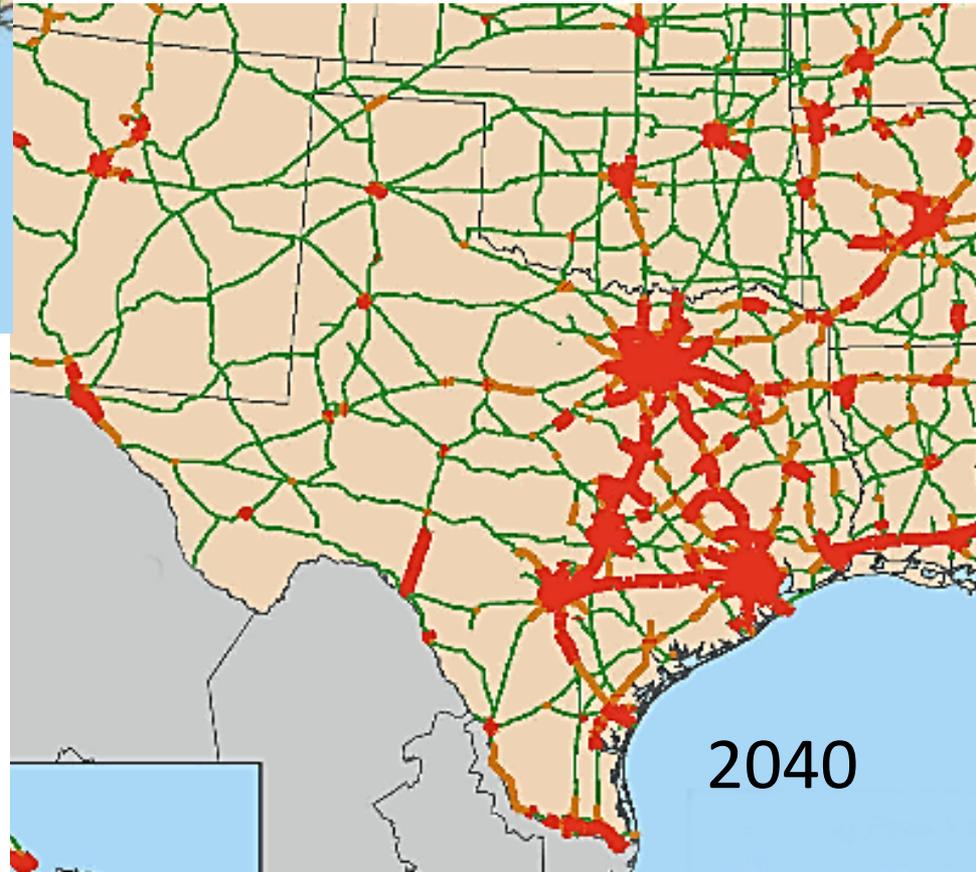
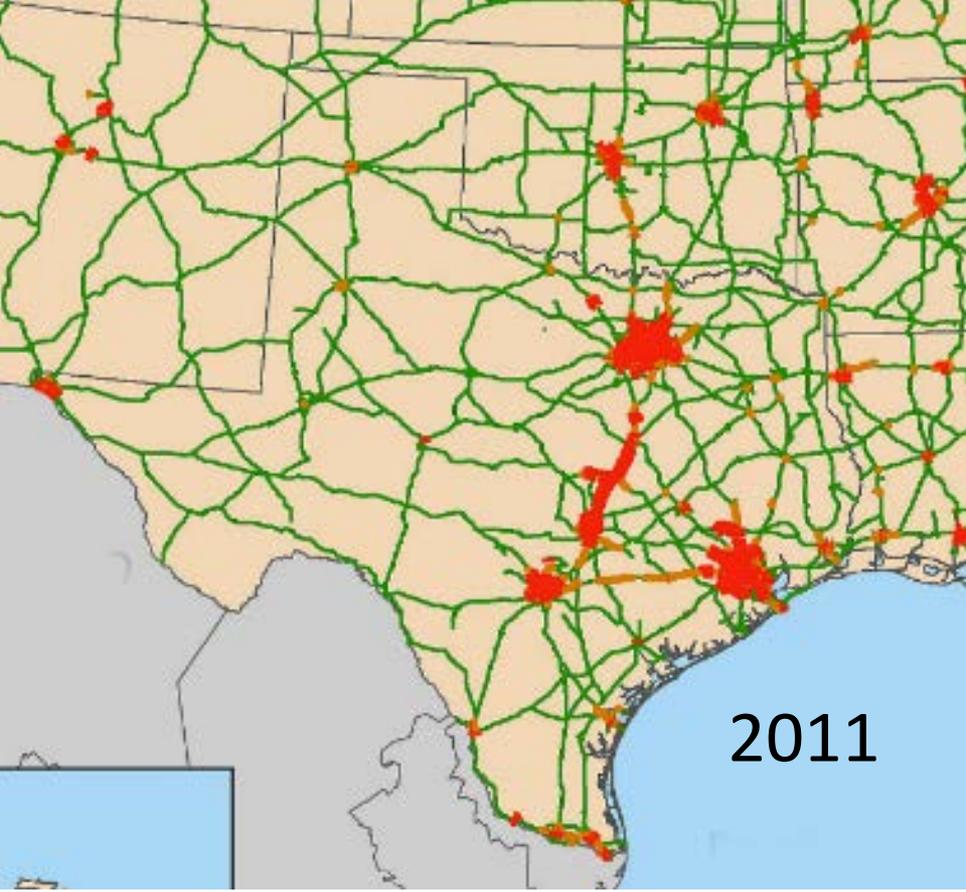


Population 2050



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

Peak-Period Congestion on NHS



Recurring Peak-Period Congestion

-  Uncongested
-  Congested
-  Highly Congeste



2017 Unified Transportation Program (UTP)

2017-2026
Transportation Planning & Programming



Unified Transportation Plan

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.



We Build Texas

Interest in Accelerated Construction

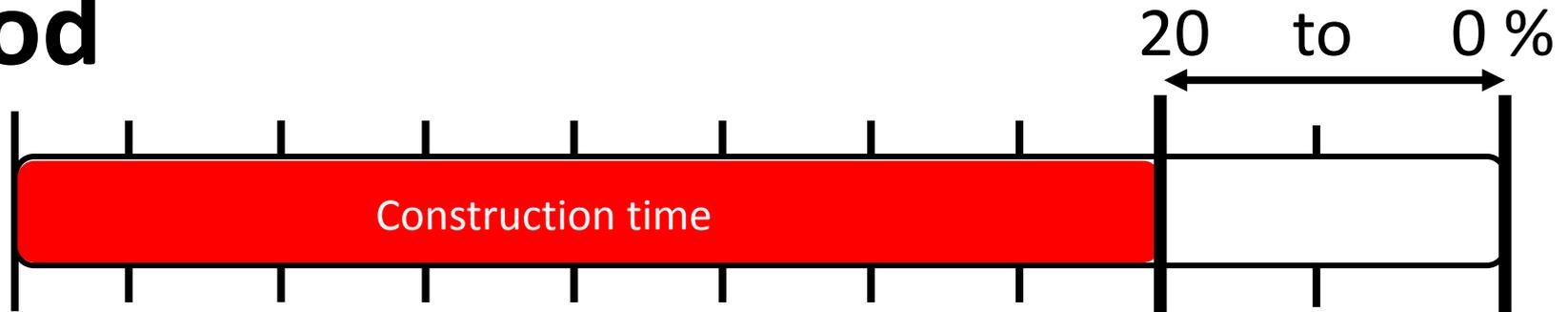
- Visibility to public
- Safety
- Economics



Acceleration Goals

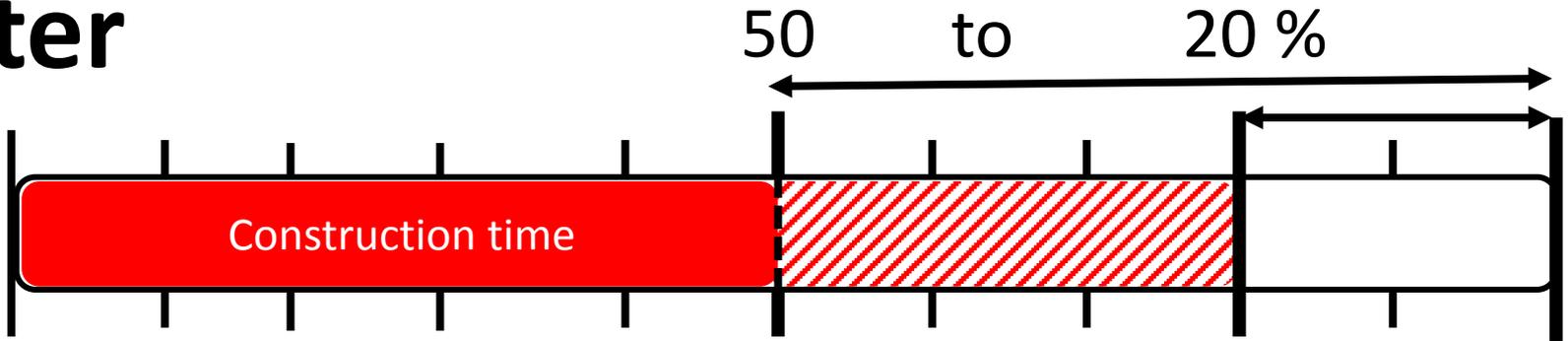


Good



reduction in time to complete project

Better



Economic Consideration

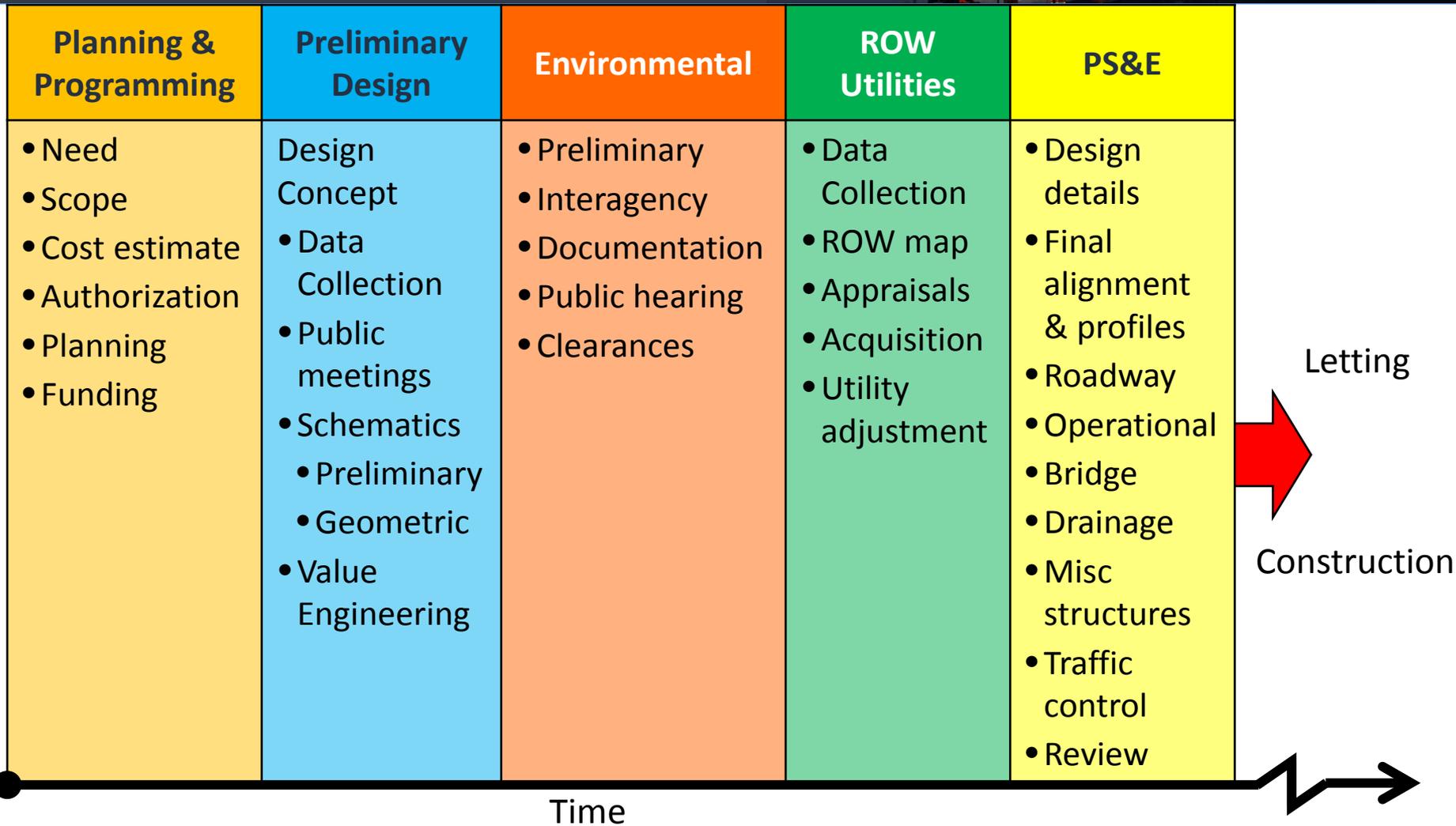


- Direct project costs
 - Agency
 - Some contractor
- Indirect project costs (user/non-user)
 - User fuel/time
 - Roadside businesses
 - Business efficiency (timely delivery)
 - Some Contractor

All costs eventually borne by the public

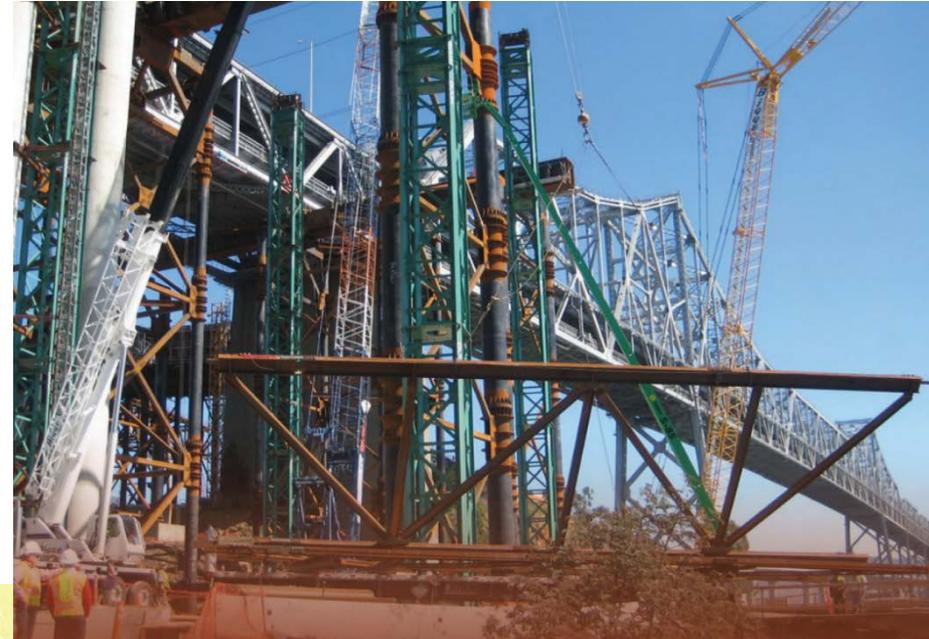


Project Delivery



Katy Freeway (IH-10)

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



SCAN TEAM REPORT
NCHRP Project 20-68A, Scan 07-02

Best Practices in Accelerated Construction Techniques

Supported by the
National Cooperative Highway Research Program

The information contained in this report was prepared as part of NCHRP Project 20-68A U.S. Domestic Scan, National Cooperative Highway Research Program.

SPECIAL NOTE: This report **IS NOT** an official publication of the National Cooperative Highway Research Program, Transportation Research Board, National Research Council, or The National Academies.



Economic Incentives - Contractor

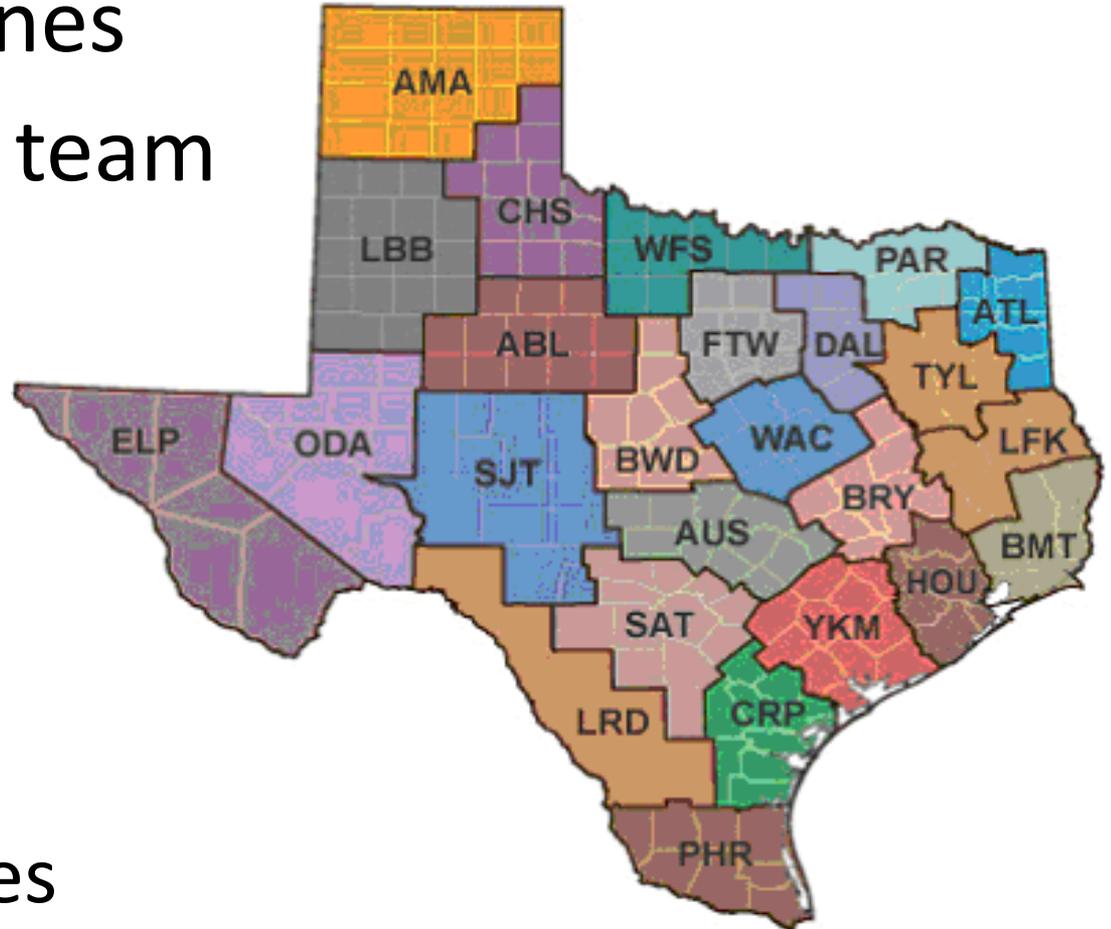
- One job/occasional job
- Return on investment (equipment)
- Bonding capacity
- Backlog of work
- Risk



Policies and Procedures



- Develop guidelines
- District support team
 - Bridges
 - Pavements
 - Construction planning
 - Drainage
 - Traffic
 - Production rates



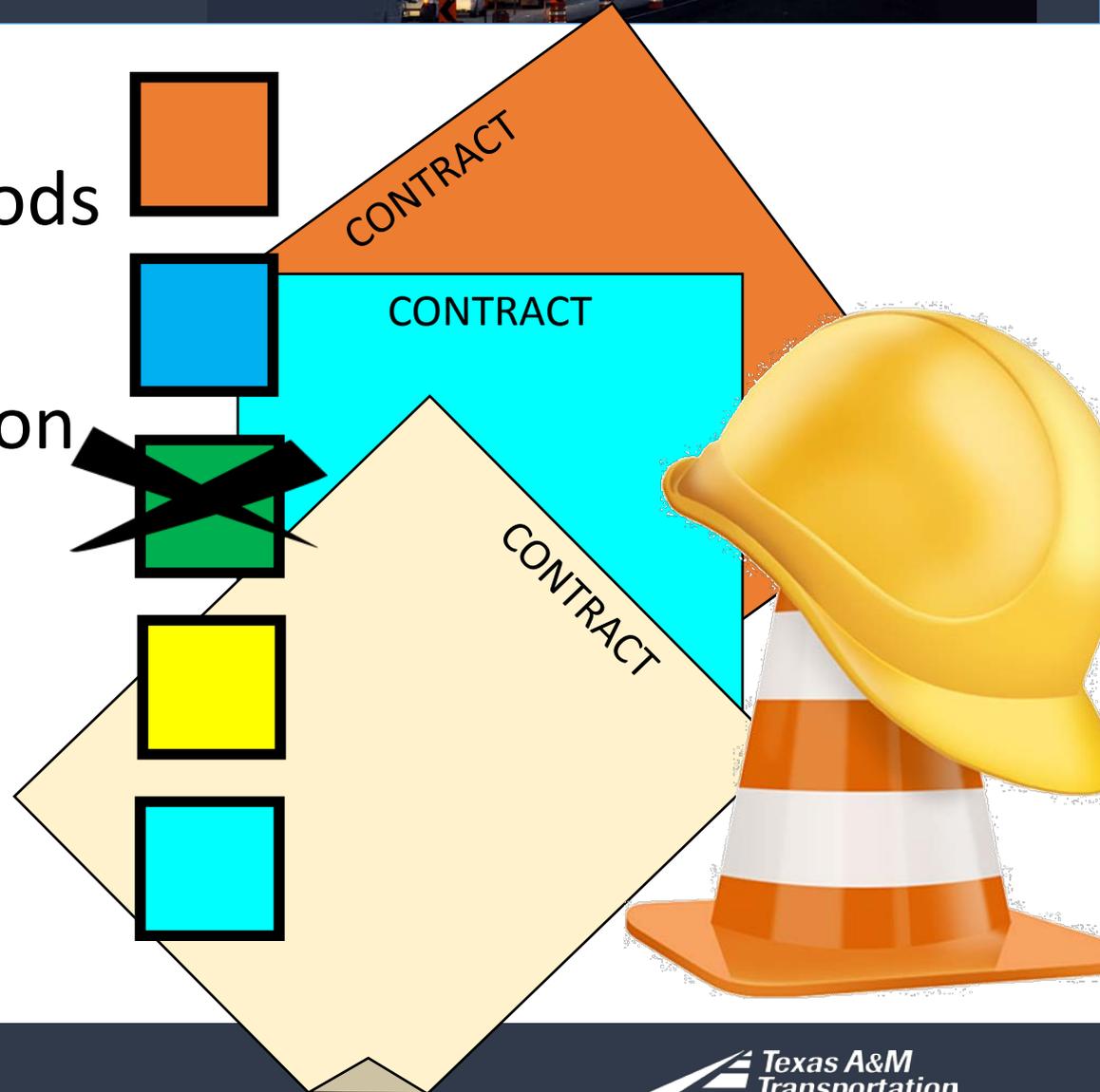
Involvement of Contractor

- 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**



Get IN

Stay IN



Get OUT

Stay OUT

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



District Workshops on Accelerated Construction



District Workshops on Accelerated Construction

District Workshops on Accelerated Construction



Texas
Department
of Transportation



Texas A&M
Transportation
Institute

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