Texas Department of Transportation

Corpus Christi/Laredo/Pharr: District Workshop on Accelerated Construction
December 7, 2017
Corpus Christi Holiday Inn

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	Jon Epps – TTI
9:50-10:10	Break	
10:10-10:40	Project Development	Gina Gallegos – TxDOT, CST
10:40-11:00	Accelerated Bridge Construction	Gregg Freeby – TxDOT, BRG
11:00-11:20	Design Considerations	Charles Benavidez – TxDOT, CRP
11:20-11:30	Traffic/Safety	Daniel Garcia – TxDOT, PHR
11:30-11:40	Public Information	Octavio Saenz – TxDOT, CMD (PHR)
11:40-12:00	Construction	Randall Moore – Haas-Anderson Construction
12:00-12:45	Lunch	
12:45-1:00	Charge to Breakout Groups • A-Pavement Strengthening • B-Pavement Widening • C-Rural Intersection Reconstruction • D-Bridge Widening • E-Small Town Main Street • F-Suburban/Rural Road Widening	David Newcomb – TTI *Moderators:* A-Juan Bosquez – TxDOT, PHR B-Breakout Omitted C-America Garza – TxDOT, CRP D-Juan Sustaita – TxDOT, PHR E-Oscar Soliz – TxDOT, CRP F-Nick Novosad – TxDOT, CRP *Recorders:* A-Jesus Saavedra – TxDOT, LRD B-Breakout Omitted C-Sergio Cantu – TxDOT, PHR D-Robert Trevino Flores – TxDOT, CRP E-Carlo Rogerio – TxDOT, LRD F-Andres Espinoza – TxDOT, PHR
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	Randall Moore – Haas-Anderson Construction
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

Texas Department of Transportation

Texas A&M Transportation Institute

Corpus Christi
Holiday Inn
December 7, 2017

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

Interest in Accelerated Construction

- Visibility to public
- Safety
- Economics

Accelerated Construction

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

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

Definition of Construction

Greenfield

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

Project Delivery

Planning & Programming	Preliminary Design	Environmental	ROW Utilities	PS&E

•Need
•Scope
•Cost estimate
•Authorization
•Planning
•Funding
	Design Concept
	• Data Collection
	• Public meetings
	• Schematics
	  • Preliminary
	  • Geometric
	• Value Engineering
		• Preliminary
		• Interagency
		• Documentation
		• Public hearing
		• Clearances
			• Data Collection
			• ROW map
			• Appraisals
			• Acquisition
			• Utility adjustment
				• Design details
				• Final alignment & profiles
				• Roadway
				• Operational
				• Bridge
				• Drainage
				• Misc structures
				• Traffic control
				• Review

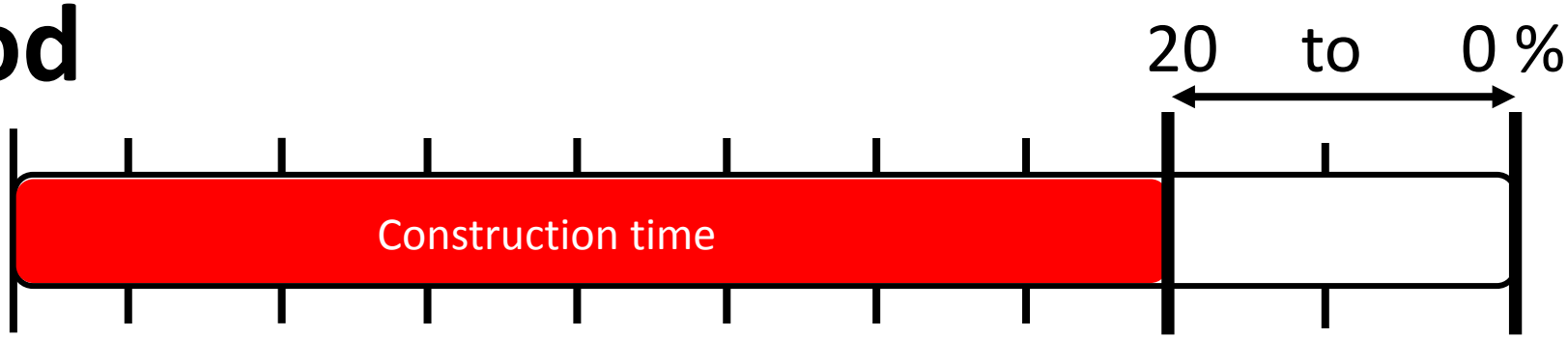
Letting

Construction

Time

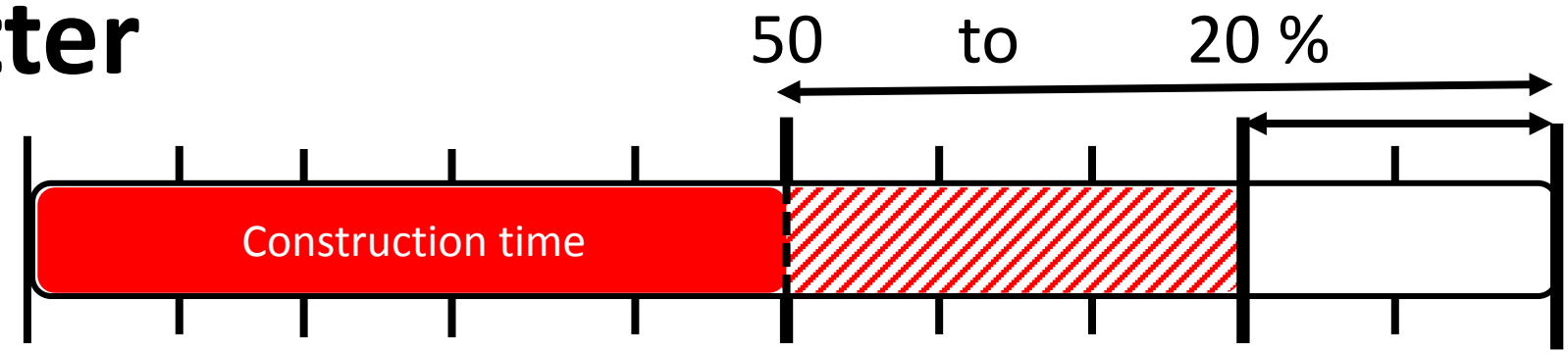
Acceleration Goals

Good



reduction in time to complete project

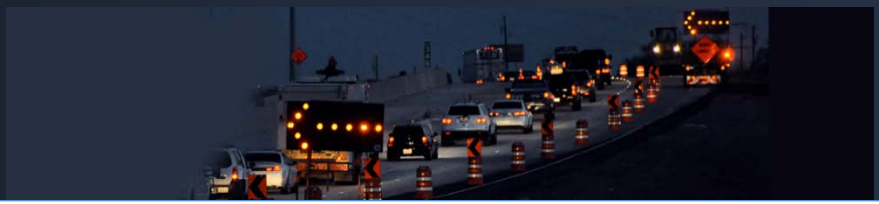
Better



CAUTION

Not All Projects Are Suitable for Accelerated Construction

Agenda



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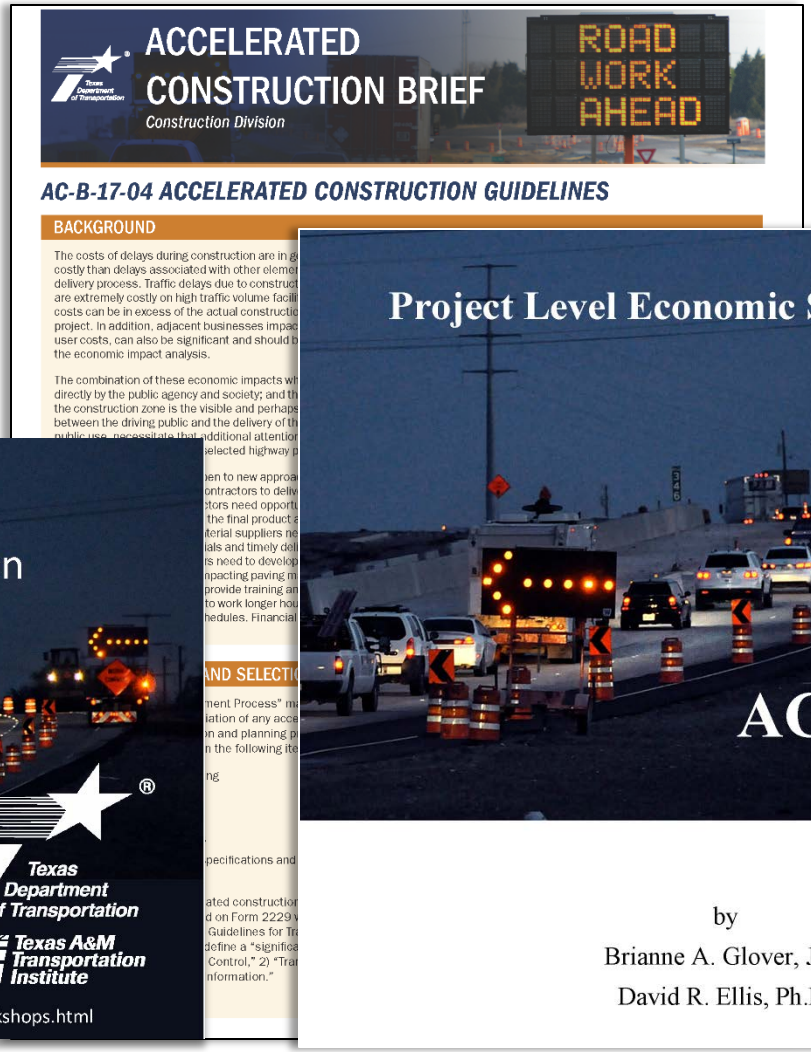
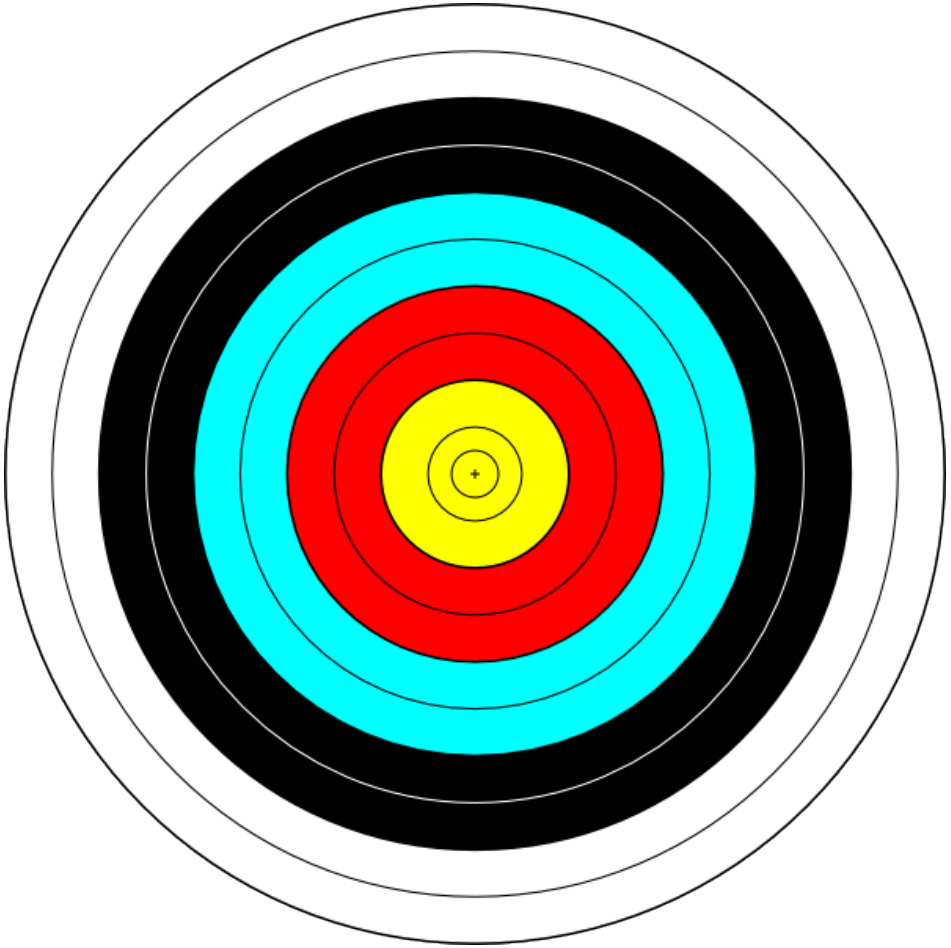
ACCELERATED CONSTRUCTION DOCUMENTS

- Briefs
- Implementation Reports
- Presentations

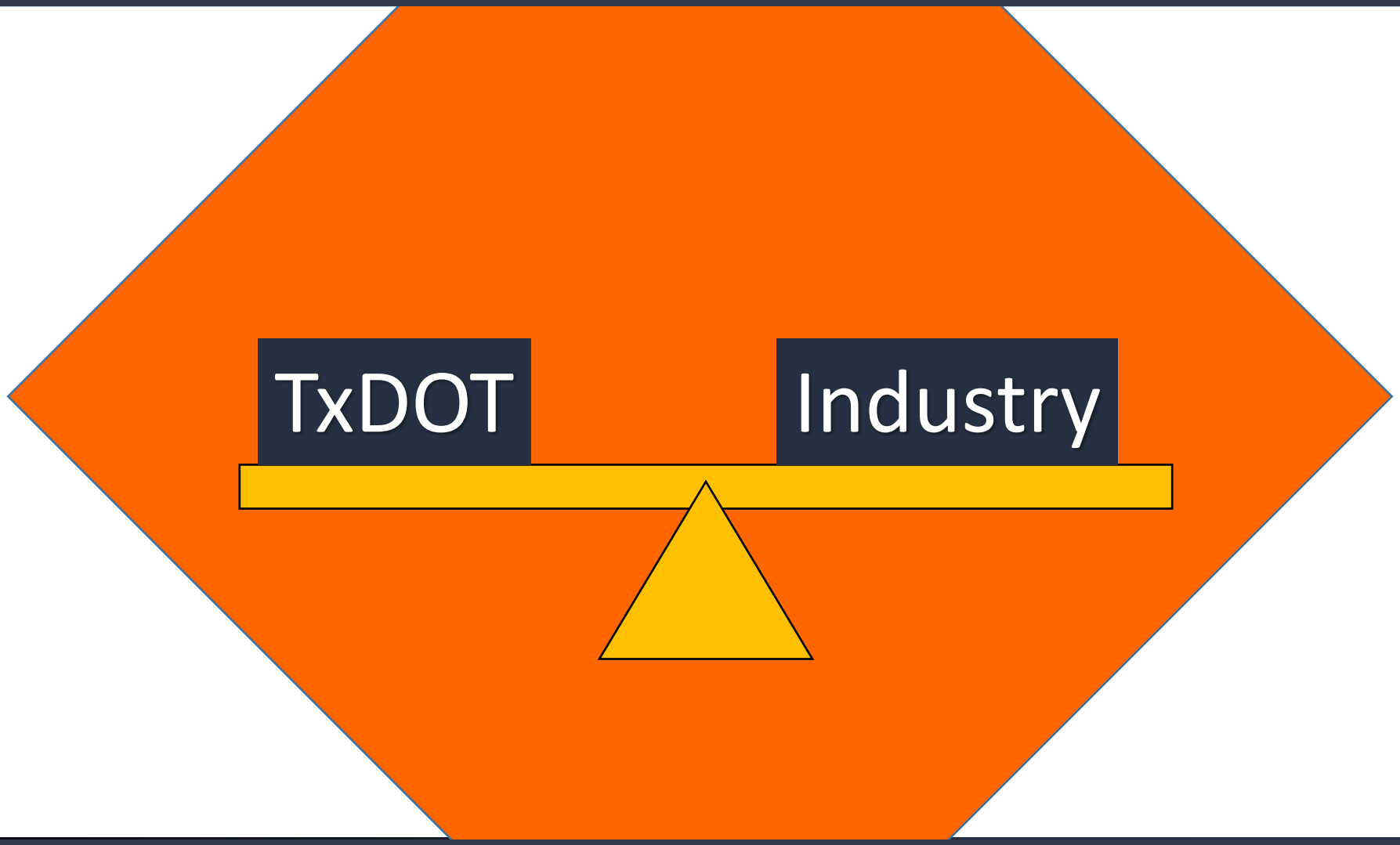


Workshop Goals

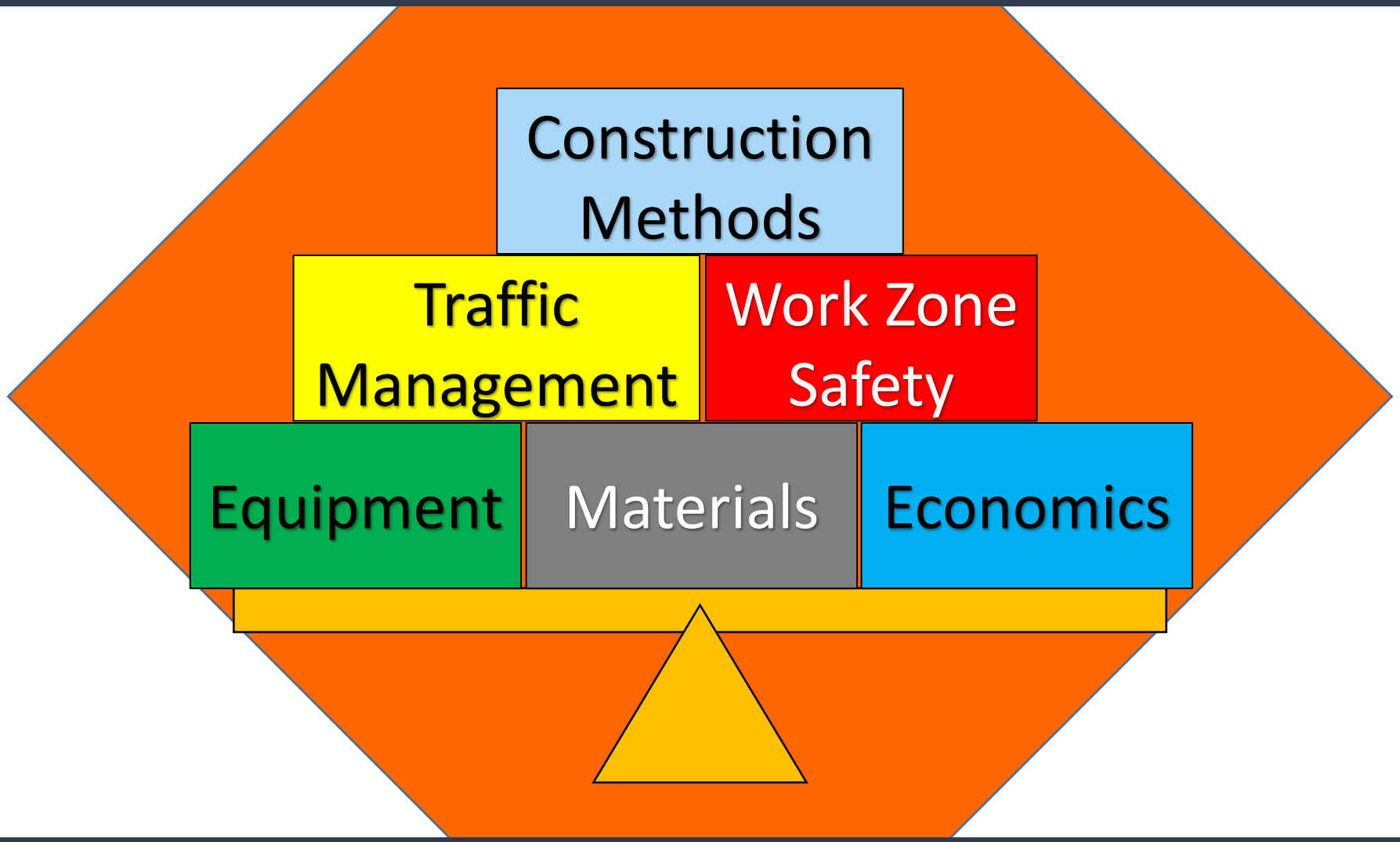
- Information sharing
- Existing TxDOT "tools"
- Identify needed "tools" & "policies"



Accelerated Construction

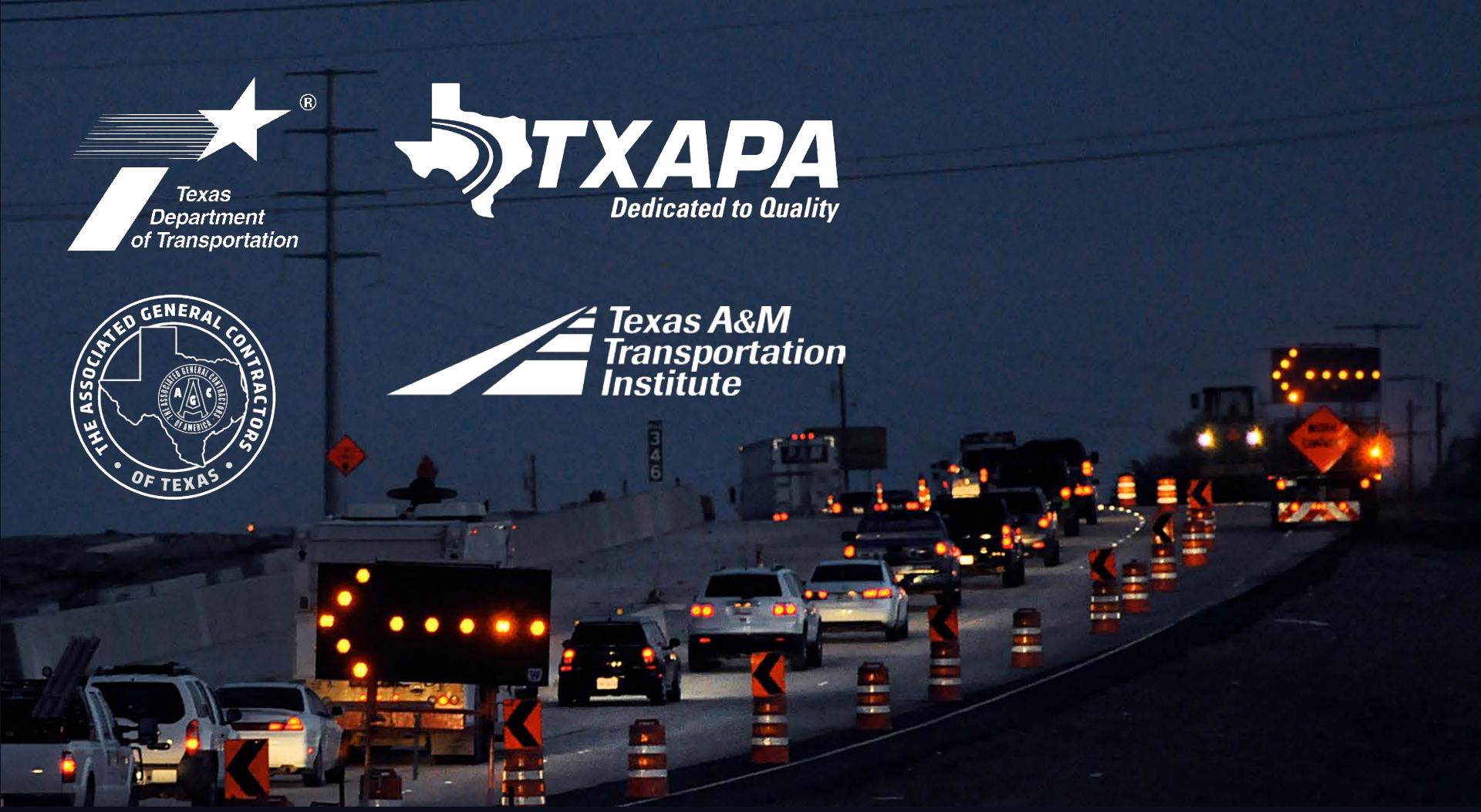


Accelerated Construction



Introductions

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

Corpus Christi
Holiday Inn
December 7, 2017

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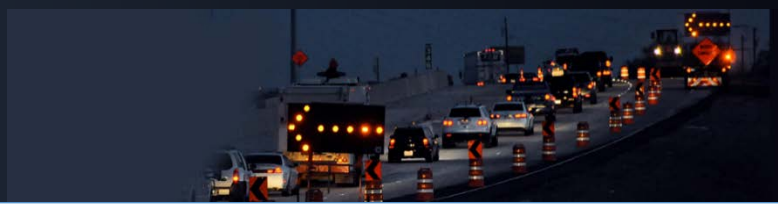
Texas A&M Transportation Institute

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)

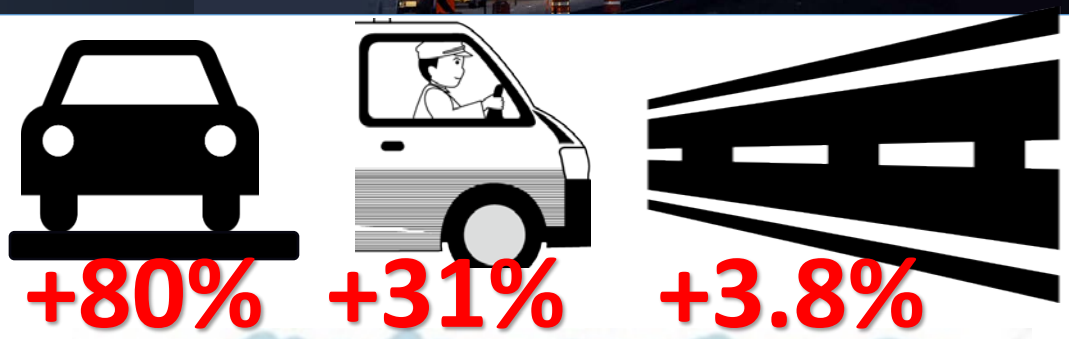
PROJECT PEGASUS

Transforming Our Downtown Freeways

1990's – 2000's Driving Forces

Increasing Demand (1980-2000)	
Vehicles Miles	+80 %
Drivers	+31 %
Lane Miles	+ 3.8%

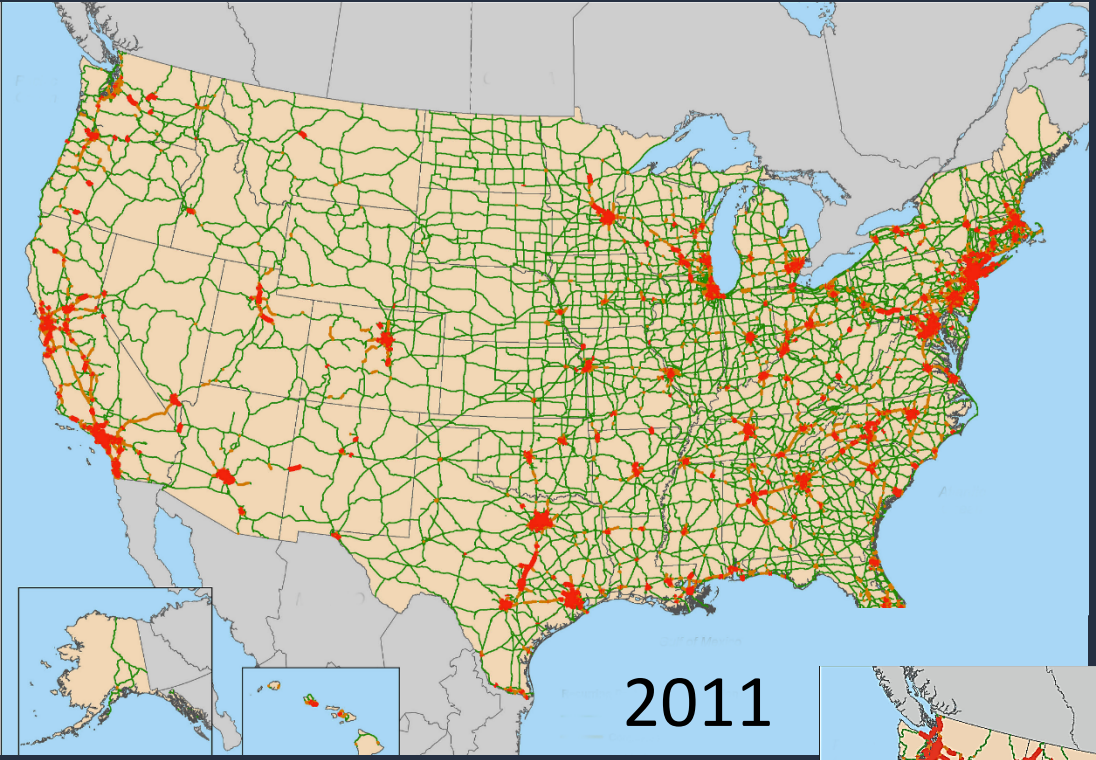
Aging System
40 % Bridges +40 Years Old
Pavements Exceeded Design Life

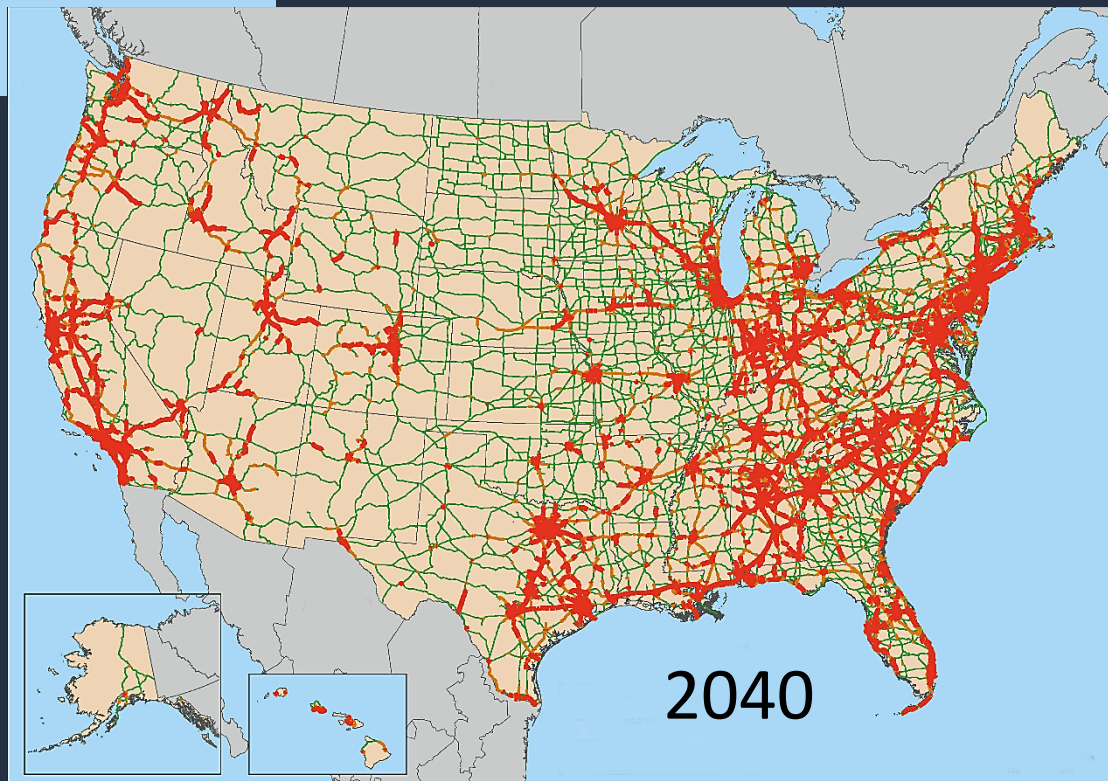


Accelerated Construction Skill Sets

• Financing	• Utilities	• Long Life Bridges
• Contracting	• ROW	• Long Life Pavements
• Work Zone	• Railroad	• Quality Control
• Mobility	• Communication /Outreach	• Modular/Prefab Construction
• Corridor Improvement	• Training	• Constructability
• Worker Health & Safety		

Peak-Period Congestion on NHS

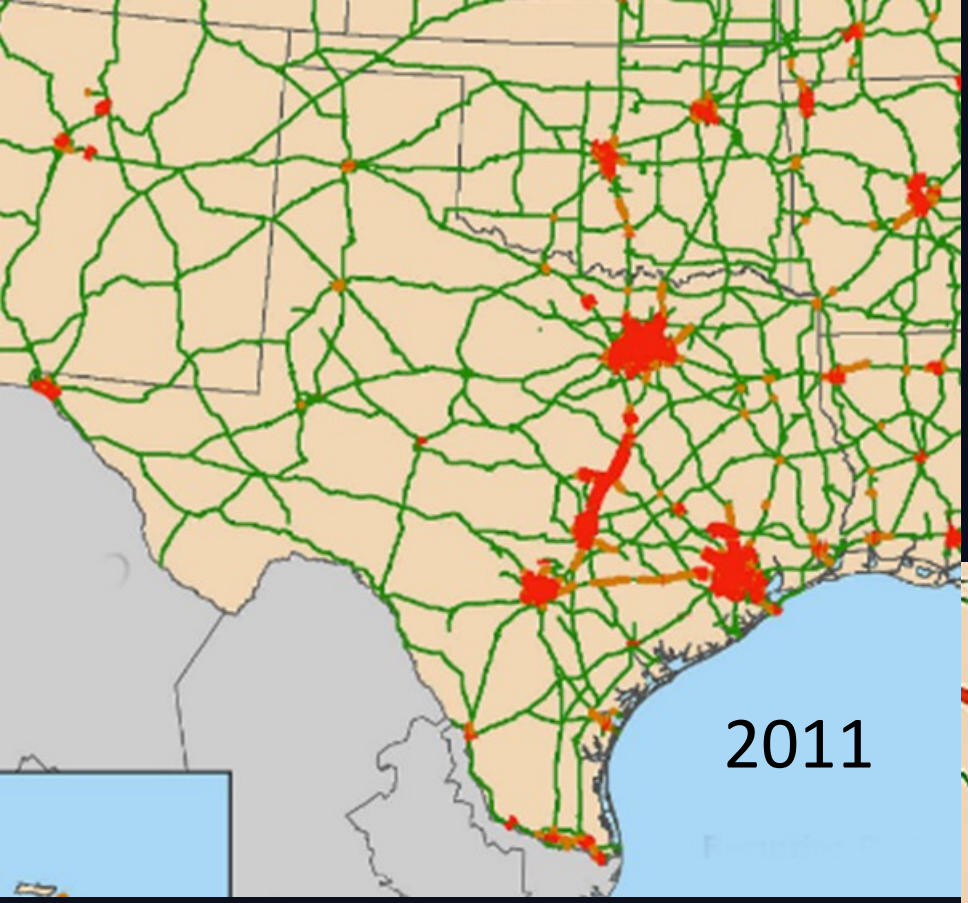


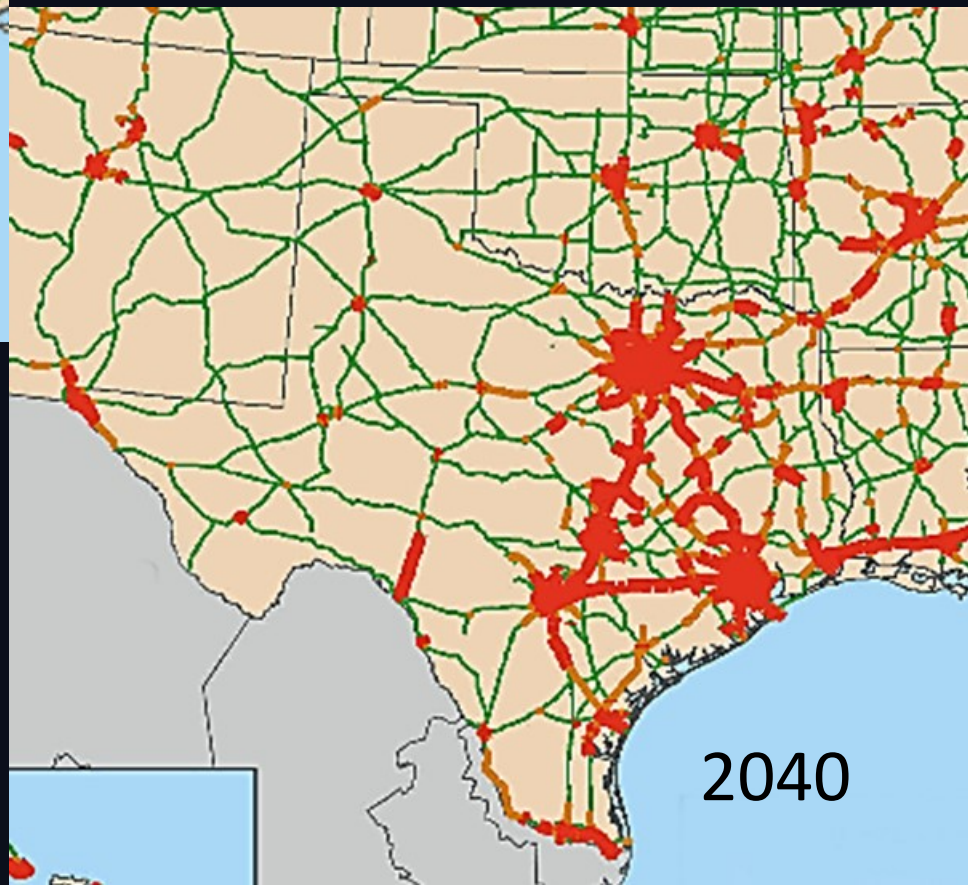


Recurring Peak-Period Congestion

- Uncongested
- Congested
- Highly Congested

Peak-Period Congestion on NHS





Recurring Peak-Period Congestion

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- Congested
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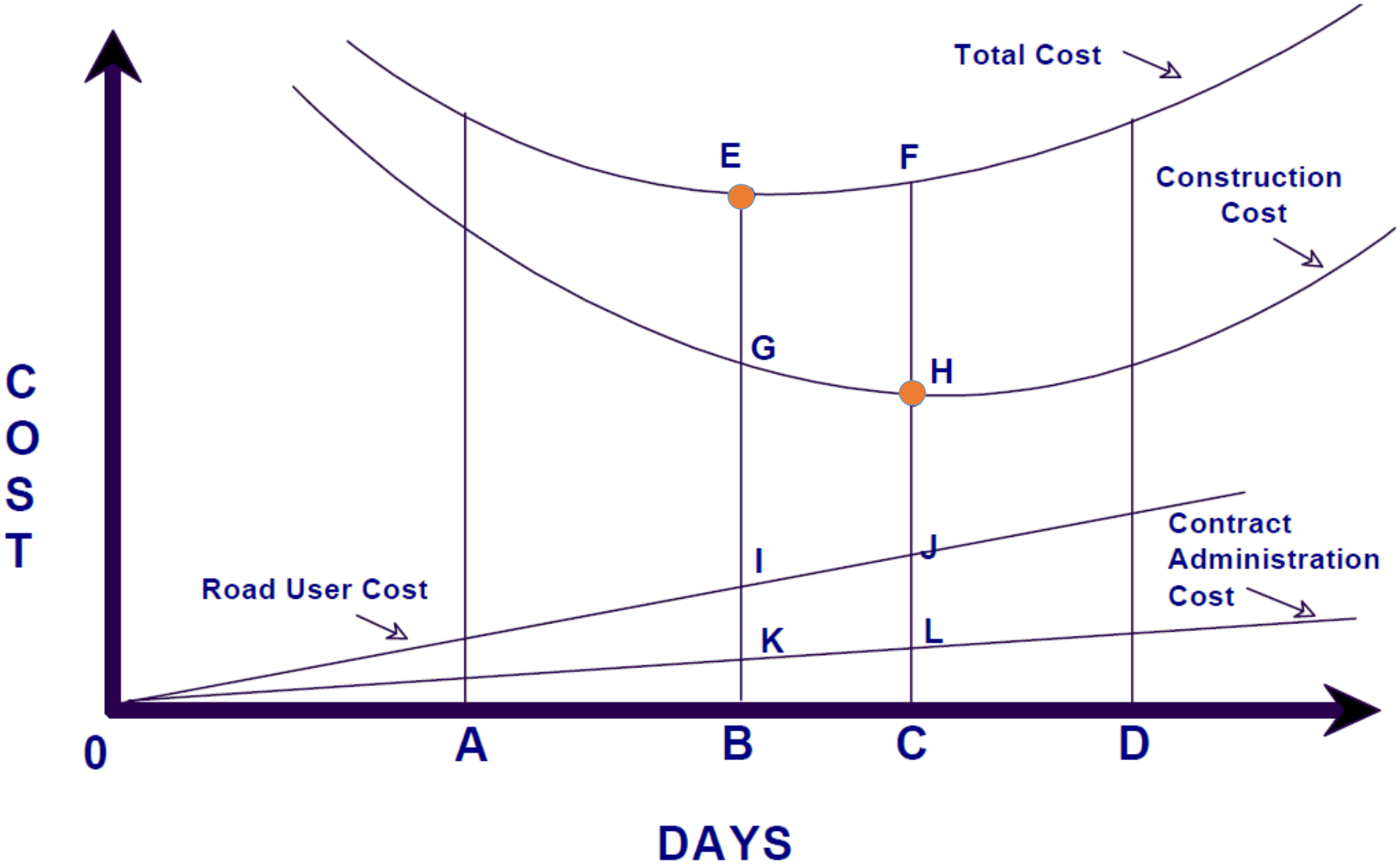
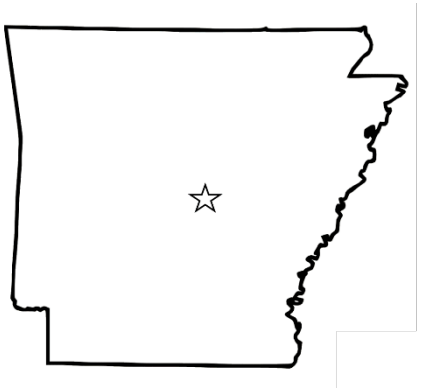
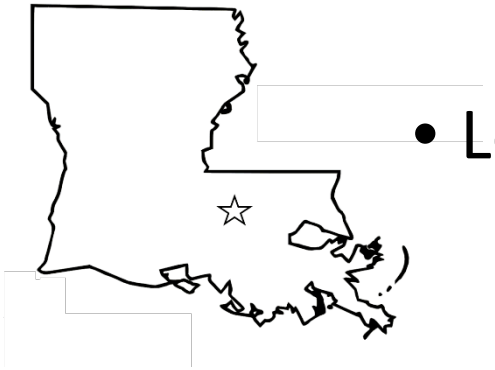
Project Costs by Type, Related to Duration



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)
- Rubblilzation with asphalt overlay
- SB and NB I-95 closed 3 months each
- $25,000/day bonus for early completion, penalty for delay
- 75% reduction in duration (185 days)
- Detour - overall project costs increased

Maine – I-295, 2008 (Lane, 2009)

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

Photo: MaineDOT

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

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

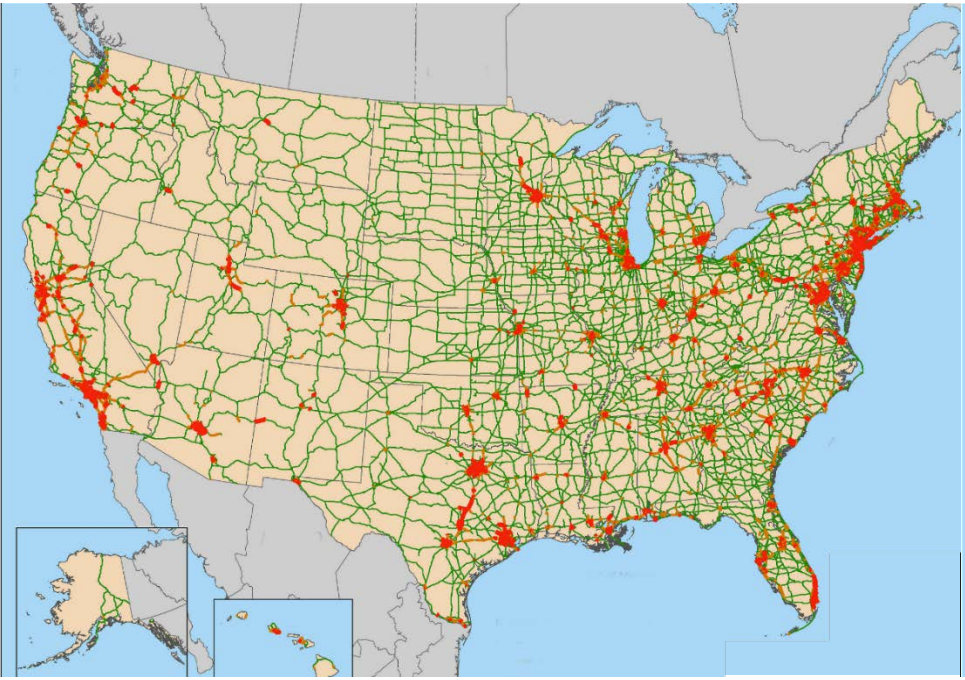
Austin Lamar Blvd. (Anderson et al. 2005)

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

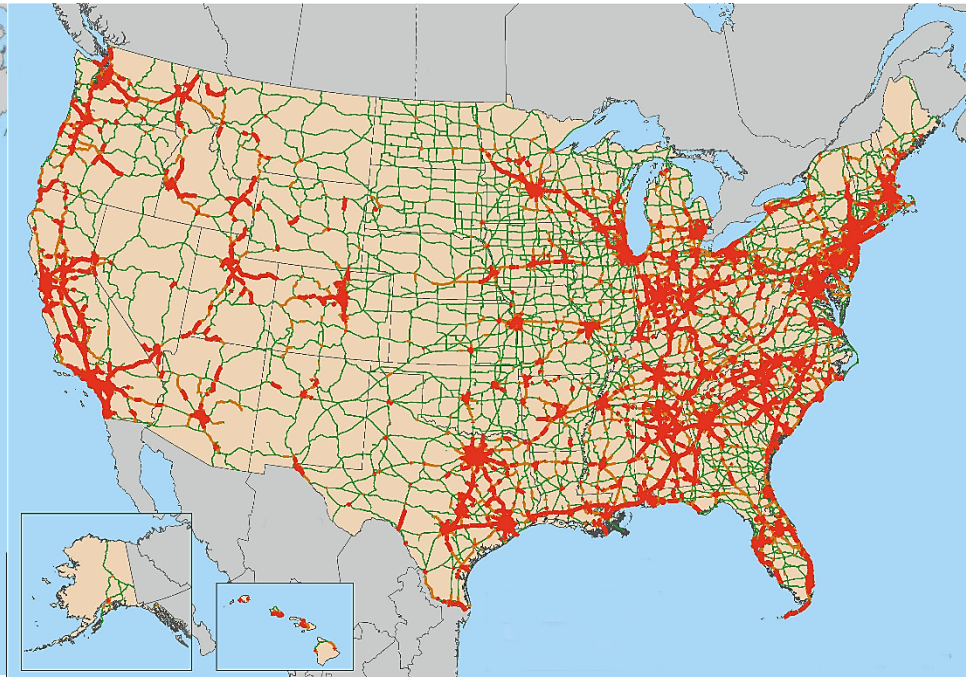
Summary

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

Things Will Not Become Simple!



(a) Year 2011



(b) Year 2040

Recurring Peak-Period Congestion

Uncongested

Congested

Highly Congested

TxDOT Interest in Accelerated Construction

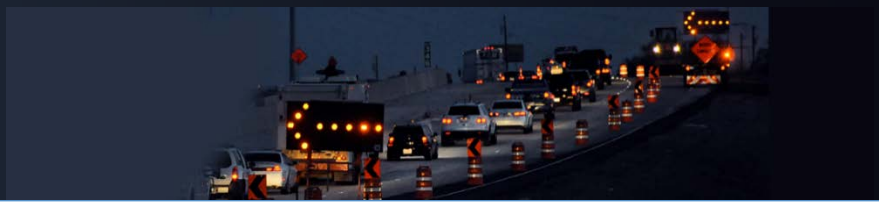
AC-PP-17-03

Randy Hopmann

Corpus Christi
Holiday Inn
December 7, 2017

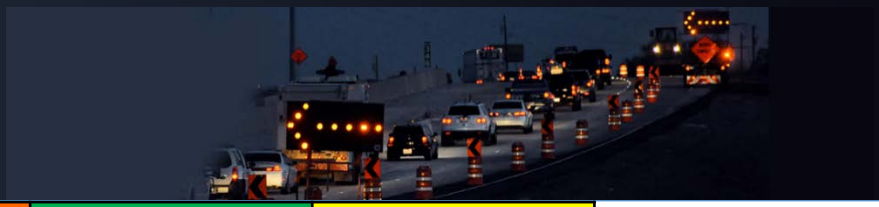
Texas Department of Transportation
Texas A&M Transportation Institute

Outline



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

Project Delivery



Planning & Programming	Preliminary Design	Environmental	ROW Utilities	PS&E

• Need
• Scope
• Cost estimate
• Authorization
• Planning
• Funding
	Design Concept
	• Data Collection
	• Public meetings
	• Schematics
	  • Preliminary
	  • Geometric
	• Value Engineering
		• Preliminary
		• Interagency
		• Documentation
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				• Misc structures
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				• Review

Letting

Construction

Time

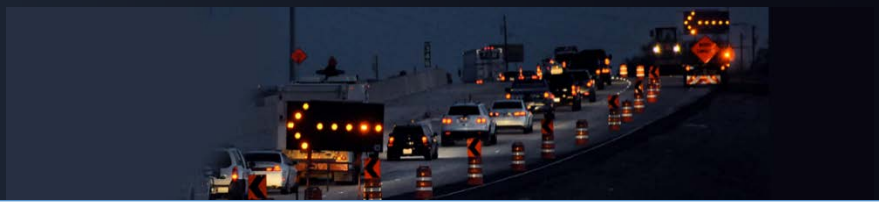
Texas Department of Transportation

Texas A&M Transportation Institute

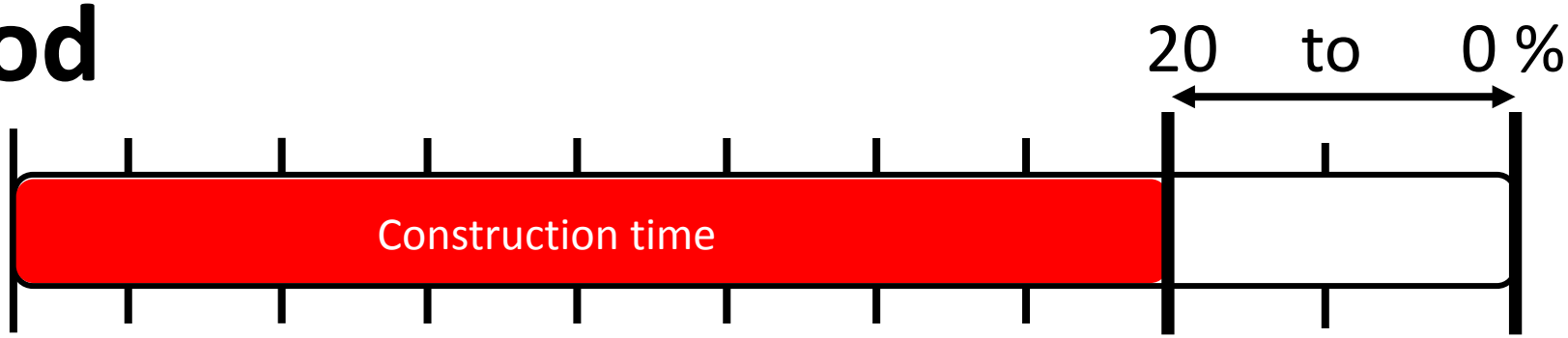
Economic Considerations-Examples

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

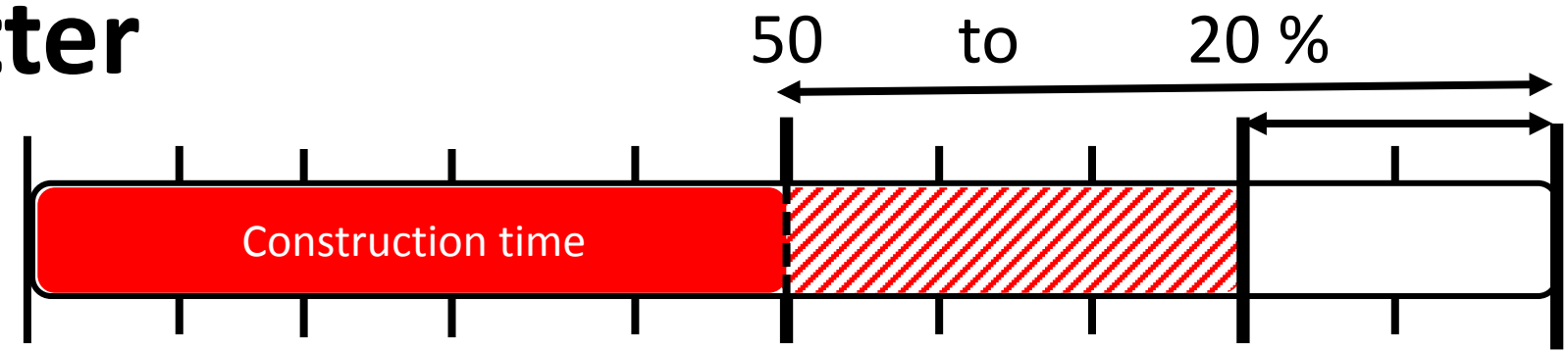


Good



reduction in time to complete project

Better



Economic Considerations - Stakeholders

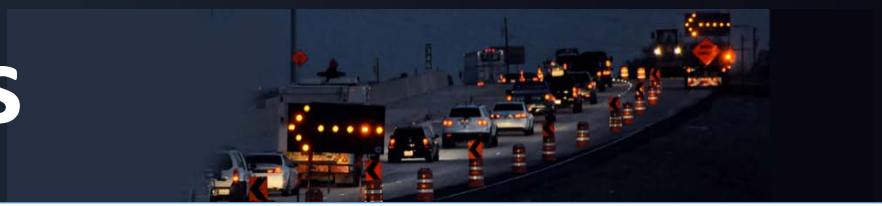
- Agency
  - Extra engineering costs
  - Extra management
  - Price escalation
  - Safety
- Public
  - Time
  - Fuel
  - Vehicle Damage
  - Safety
- Contractor
  - Unproductive labor/ equipment
  - Material inventory
  - Insurance/bonding capacity
  - Safety

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



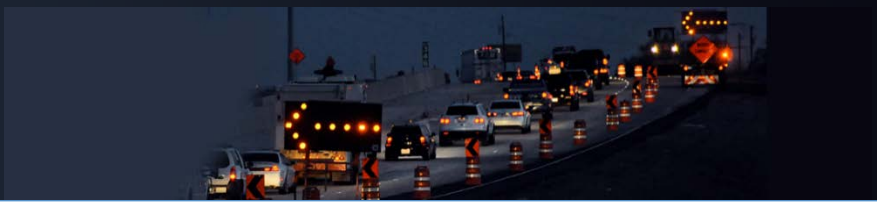
- Reduce time traffic in work zone
- Traffic not in work zone
- Reduce user delay costs
  - Fuel
  - Time
- Vehicle maintenance
- User cost savings exceed construction costs

Reduce Construction Time

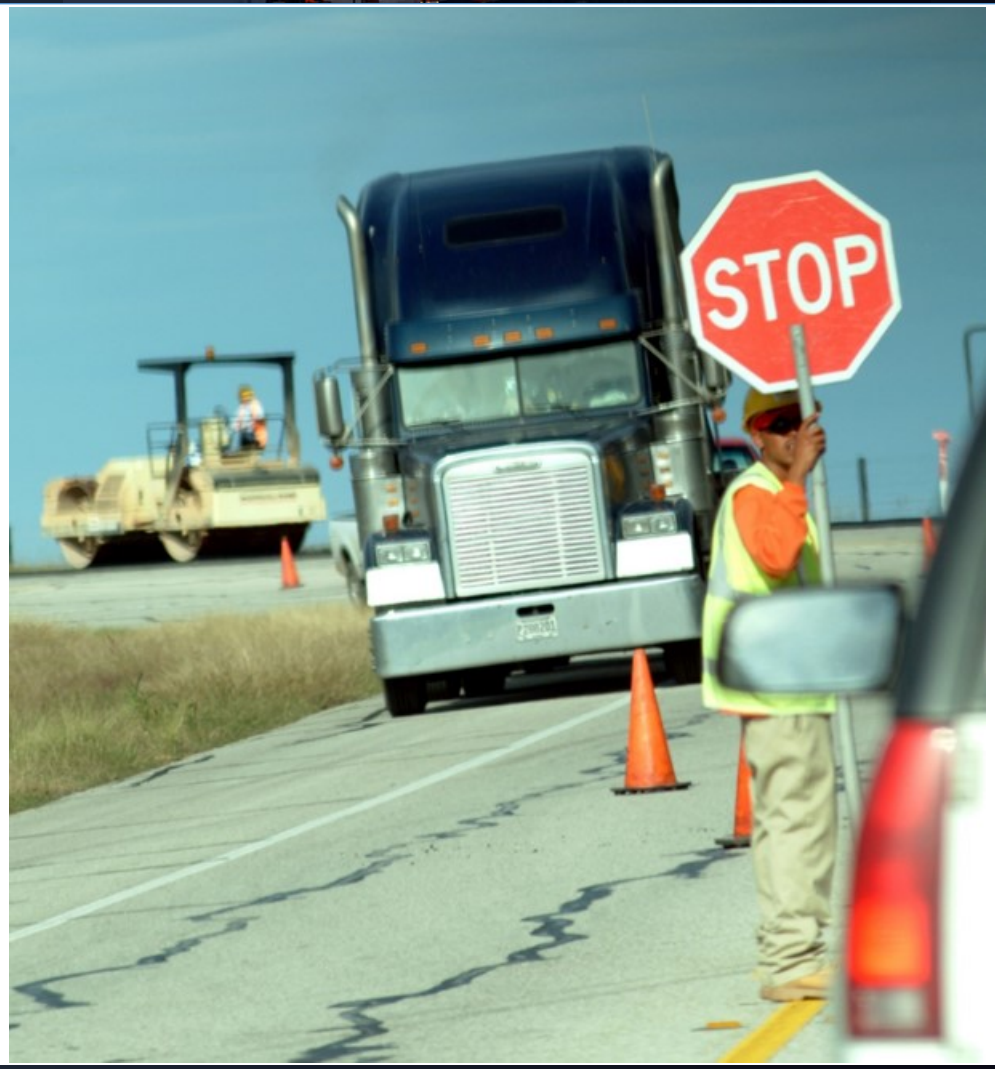
- Contracting methods
  - Design/Bid/Build
  - Cost-Plus Time (A+B)
  - Interim completion dates
  - No-excuses incentives
  - Construction manager at risk
  - Design/Build
- Lane occupancy time
  - Off peak traffic
    - Day
    - Night
  - Long weekend closures
  - Close facility

Reduce Construction Time

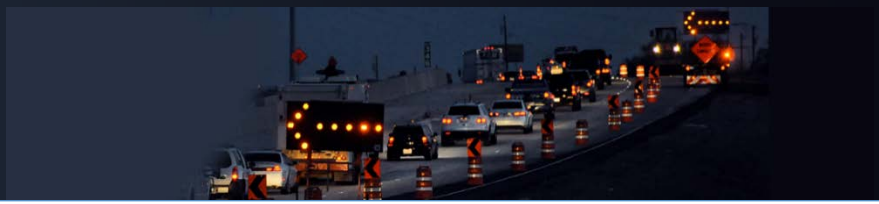
- Bridges/Culverts (ABC)
- Pavements



Not for every project



Outline



- Background
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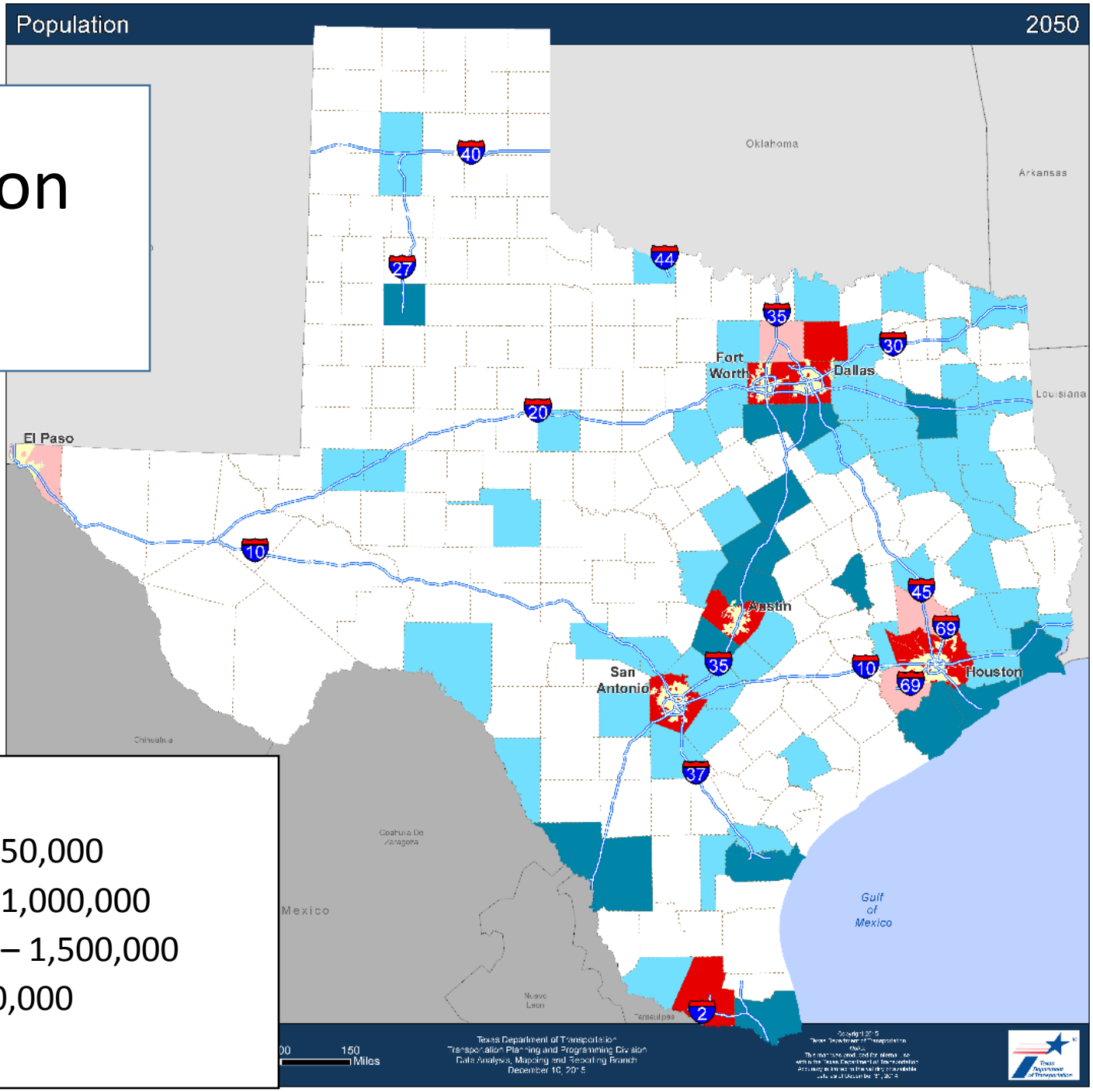
Population 2050



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

Texas Department of Transportation

2017 Unified Transportation Program (UTP)

2017–2026

Transportation Planning & Programming

Unified Transportation Plan

Texas Department of Transportation

Texas A&M Transportation Institute

We Build Texas

Field Guide to

Successful Project Delivery

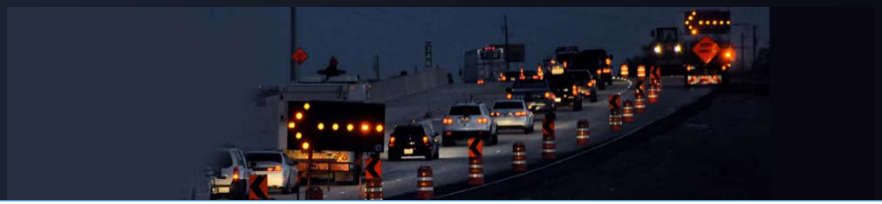
We build Texas – Safely
We build Texas – Quality
We build Texas – On Time
We build Texas – Together

Working together to successfully deliver projects.

We Build Texas

Workforce

Outline



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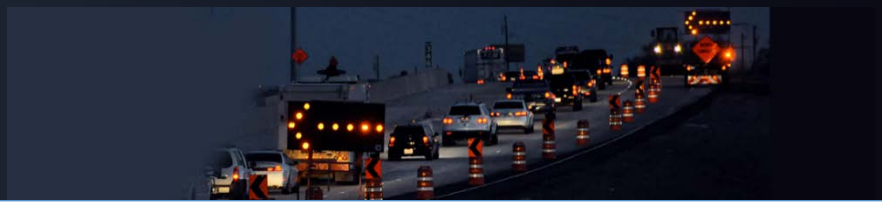
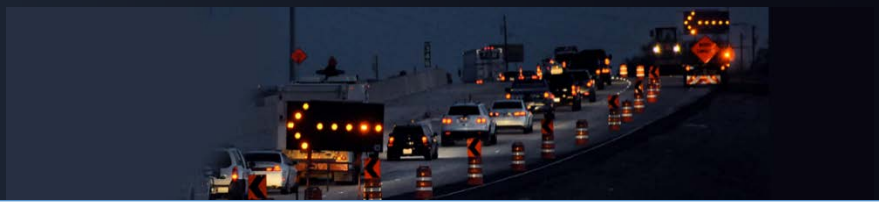


- 1998 – Heald
  - Legislators – TxDOT & User Costs for Liquidated Damage
  - Commission – Reduce Construction Time
  - Incentives/disincentives
- 2001 – Johnson's "Transportation Working Group"
  - Reduce project delivery time by 15% by 2006
  - Address cost of disruption of traffic
- 2002 – Saenz
  - Accelerated construction – Businesses & traffic flow impacted
  - Calendar day definition of working day
  - Milestones for incentives/disincentives
  - Lane rental
  - A+B

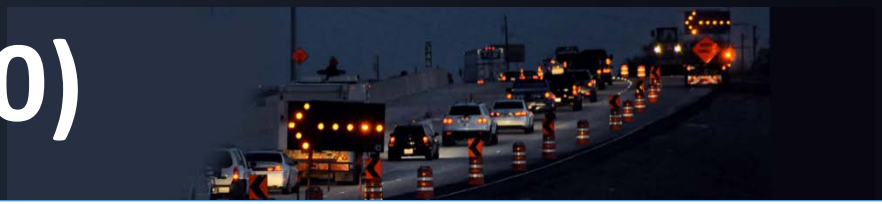
Wes Heald



- 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

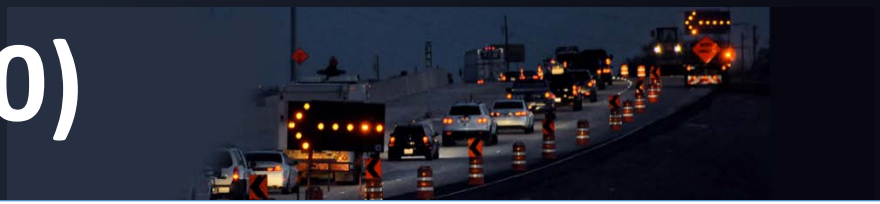
Amadeo Saenz

Katy Freeway (IH-10)

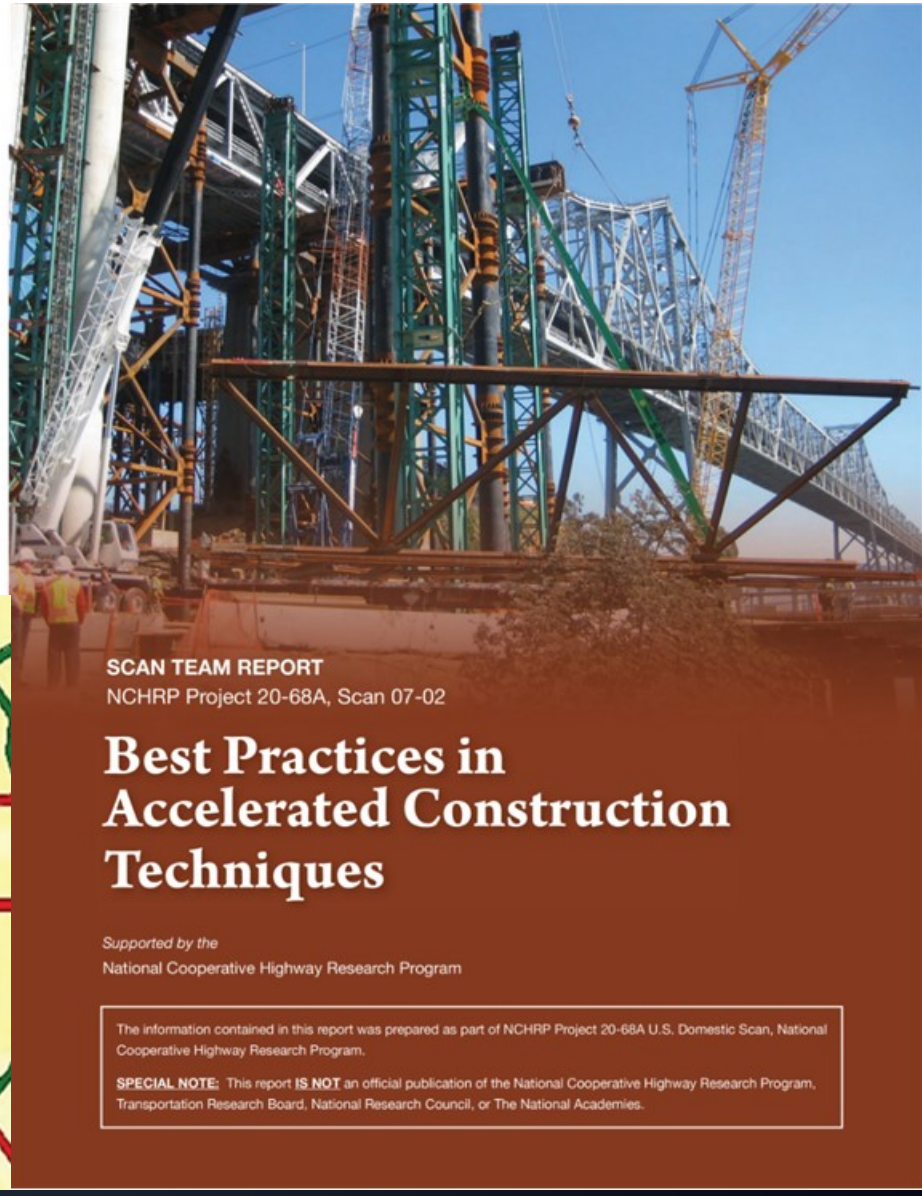


- Traditional construction – 12 years
- Accelerated construction – 6 years

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

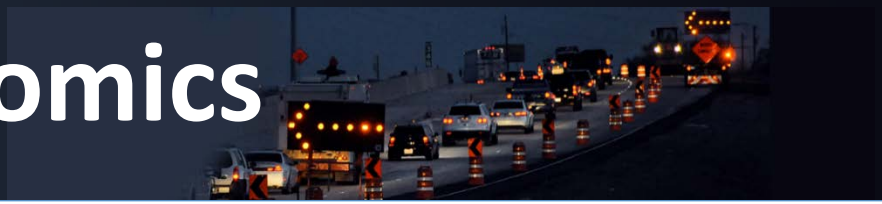
Best Practices in Accelerated Construction Techniques

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.

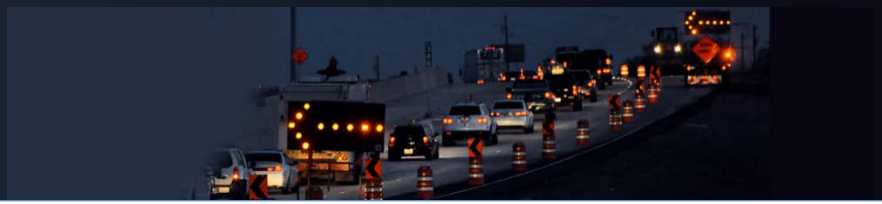
SPECIAL NOTE: This report IS NOT an official publication of the National Cooperative Highway Research Program, Transportation Research Board, National Research Council, or The National Academies.

Katy Freeway Economics



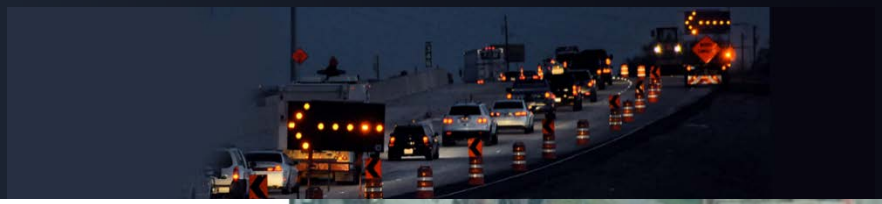
- $150 - $200 million/year
- Accelerated construction benefit - $2.8 billion
- Cost of accelerated construction - $309 million
- B/C ratio – 9.0

Outline



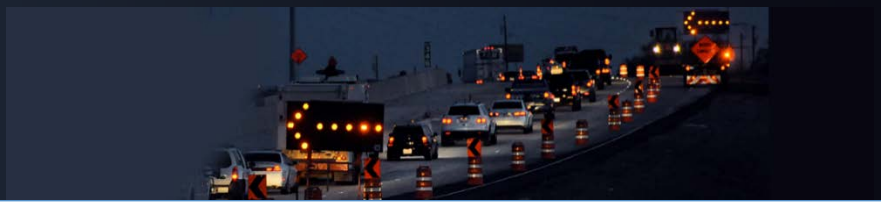
- Background
- Texas Landscape
- Texas History
- **Opportunities**
- Workshop Outcomes

Materials



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

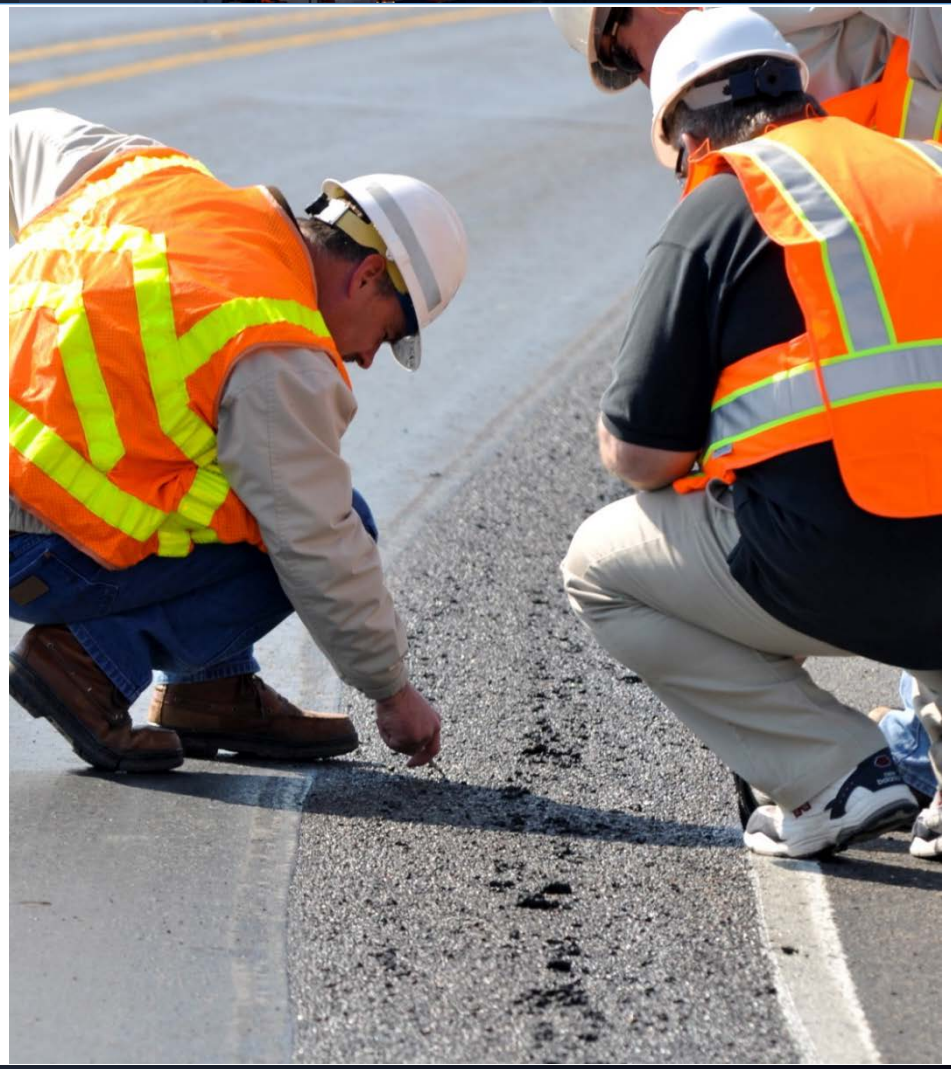
Equipment



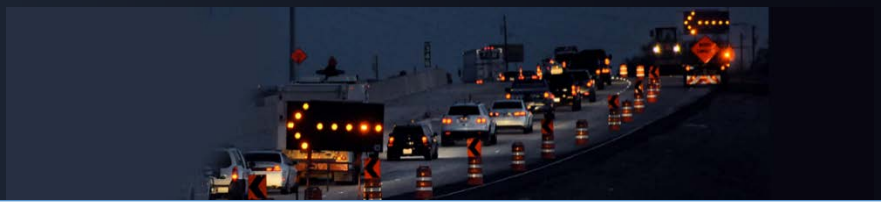
- Materials handling
- Demand for equipment
- Prototype/production unit/redesign
- Cost

Process Control/Quality Control

- High production/ placement rates
- Rapid tests
- Quick feedback to produce quality
- Management to insure quality

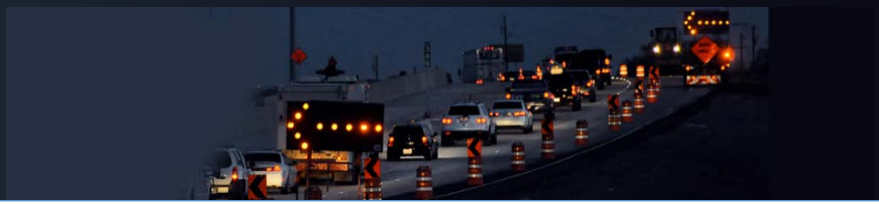


Traffic Control



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

Workforce

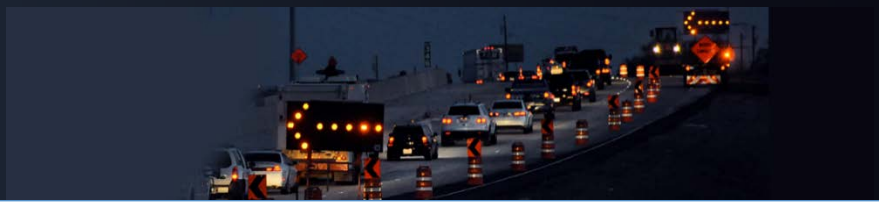


- Skill set
  - New equipment
  - New materials
  - QC/QA
- Congested work zone
- Shift length
- Housing/facilities
- Personal life
- Management team
- Financial

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

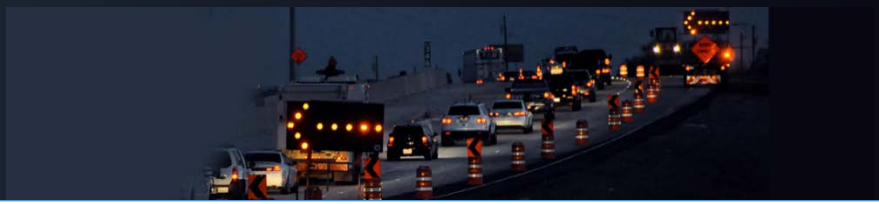
Planned Accelerated Construction (Cont'd)

- 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

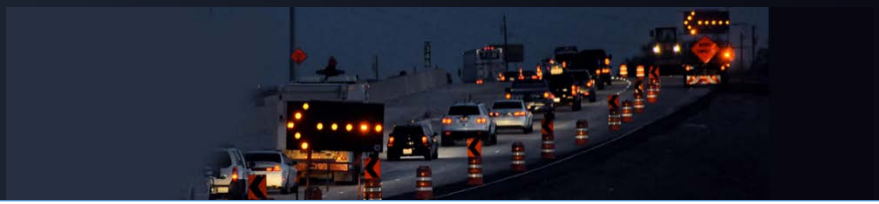
- Consider accelerated construction in planning stage
- Isolate construction work from traffic
- Reuse existing materials on site
- Maintain lane closure as long as possible
- Innovative approaches to traffic handling

Outline

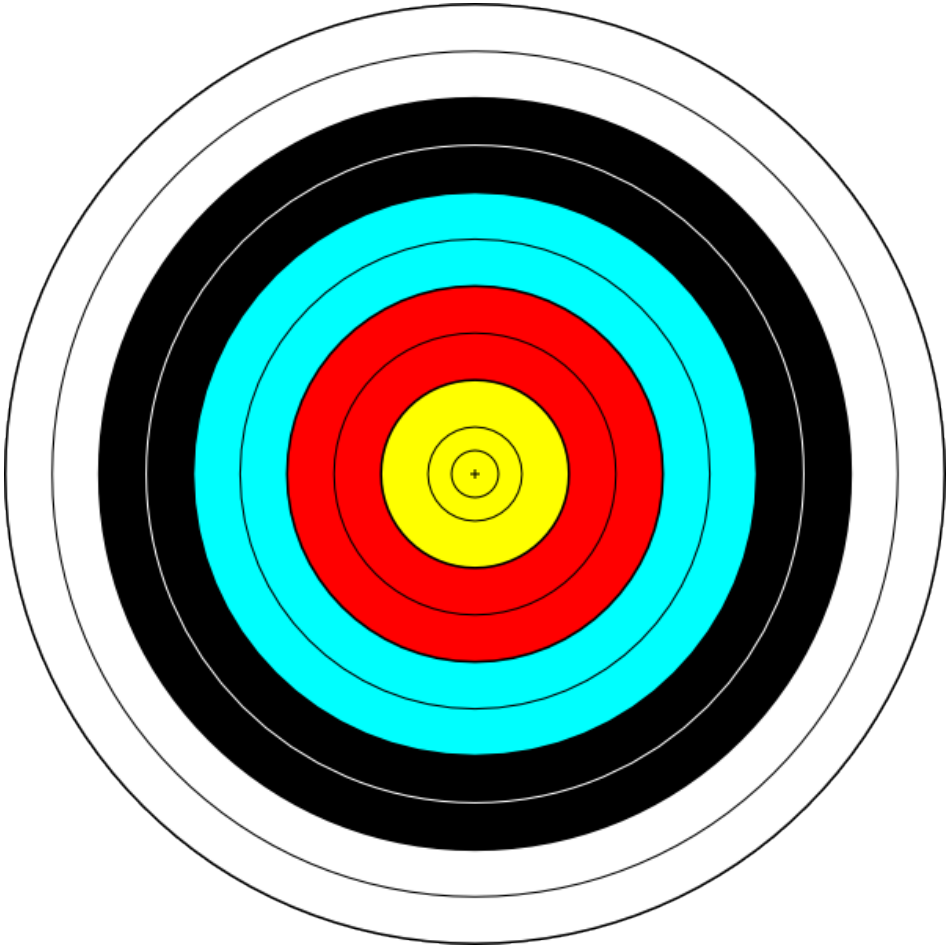


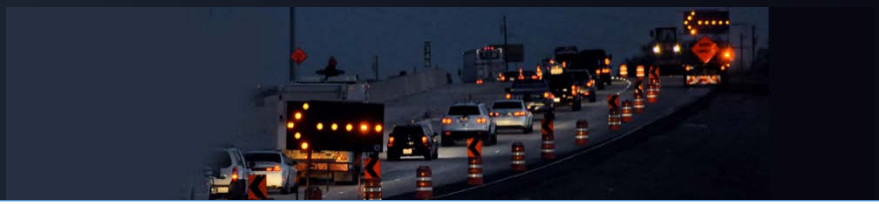
- Background
- Texas Landscape
- Texas History
- Opportunities
- **Workshop Outcomes**

Workshop Goals



- Information sharing
- Existing TxDOT "tools"
- Identify needed "tools" & "policies"





CAUTION

Not All Projects Are Suitable for Accelerated Construction

District Workshops on
Accelerated Construction

Corpus Christi
Holiday Inn
December 7, 2017

Texas Department of Transportation

Texas A&M Transportation Institute

District Workshops on Accelerated Construction

Economic Screening Tools

AC-PP-17-04

Jon Epps

Corpus Christi
Holiday Inn
December 7, 2017

Texas Department of Transportation
Texas A&M Transportation Institute

Project Level Economic Screening Tool

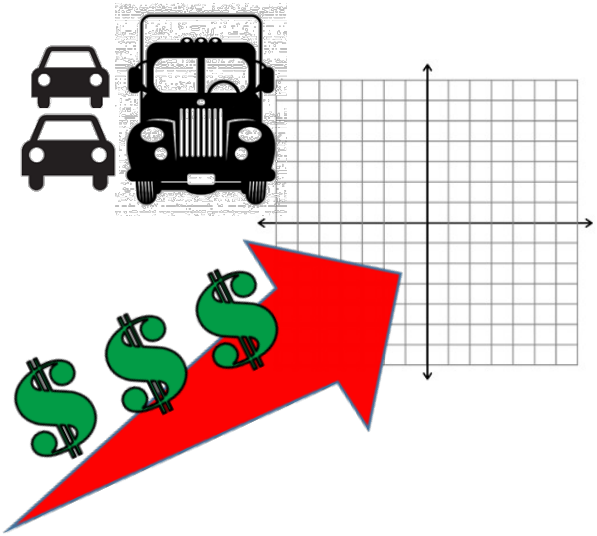
- Benefit-Cost tool
- Focus – road user costs and economic losses

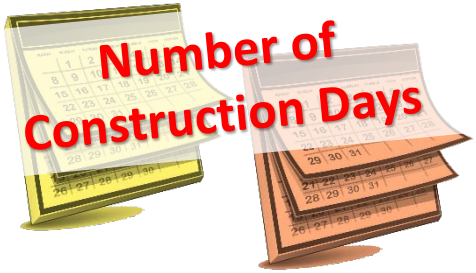
Economic Impact

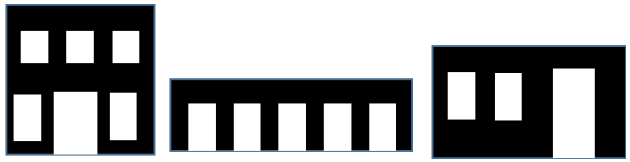
Project Level Economic Screening Tool

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

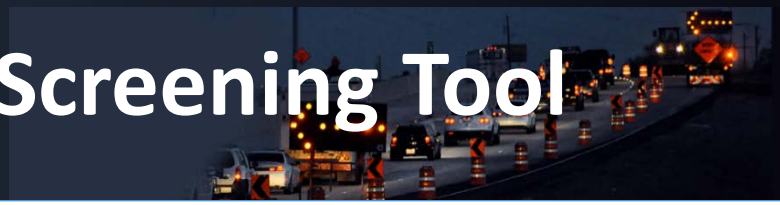
Suburban

- 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**

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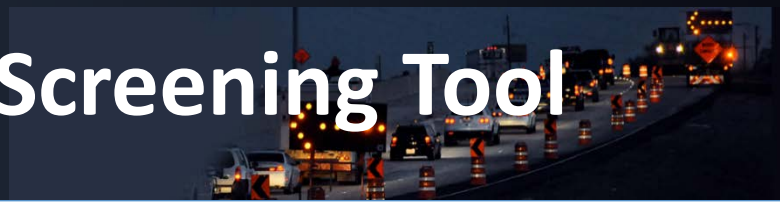
Project Level Economic Screening Tool



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Project Level Economic Screening Tool

Construction Conditions

Traditional Construction Parameters	Values	Accelerated Construction Parameters	Values
Segment 1:		*Segment 1:*	
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%
Segment 2:		*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:		*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:		*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	

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%

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

Construction Conditions

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

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

Project Level Economic Screening Tool

Economic Loss

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

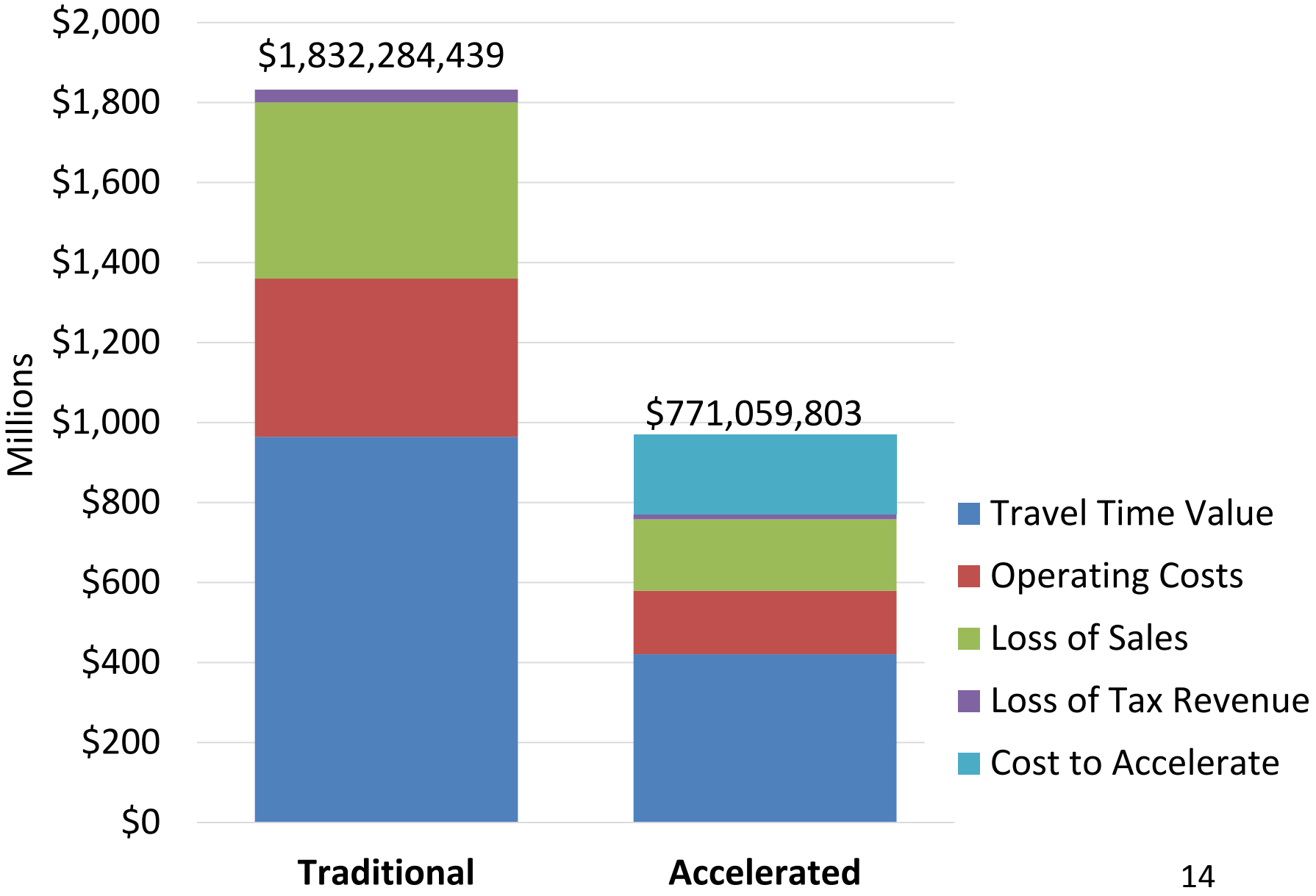
Results

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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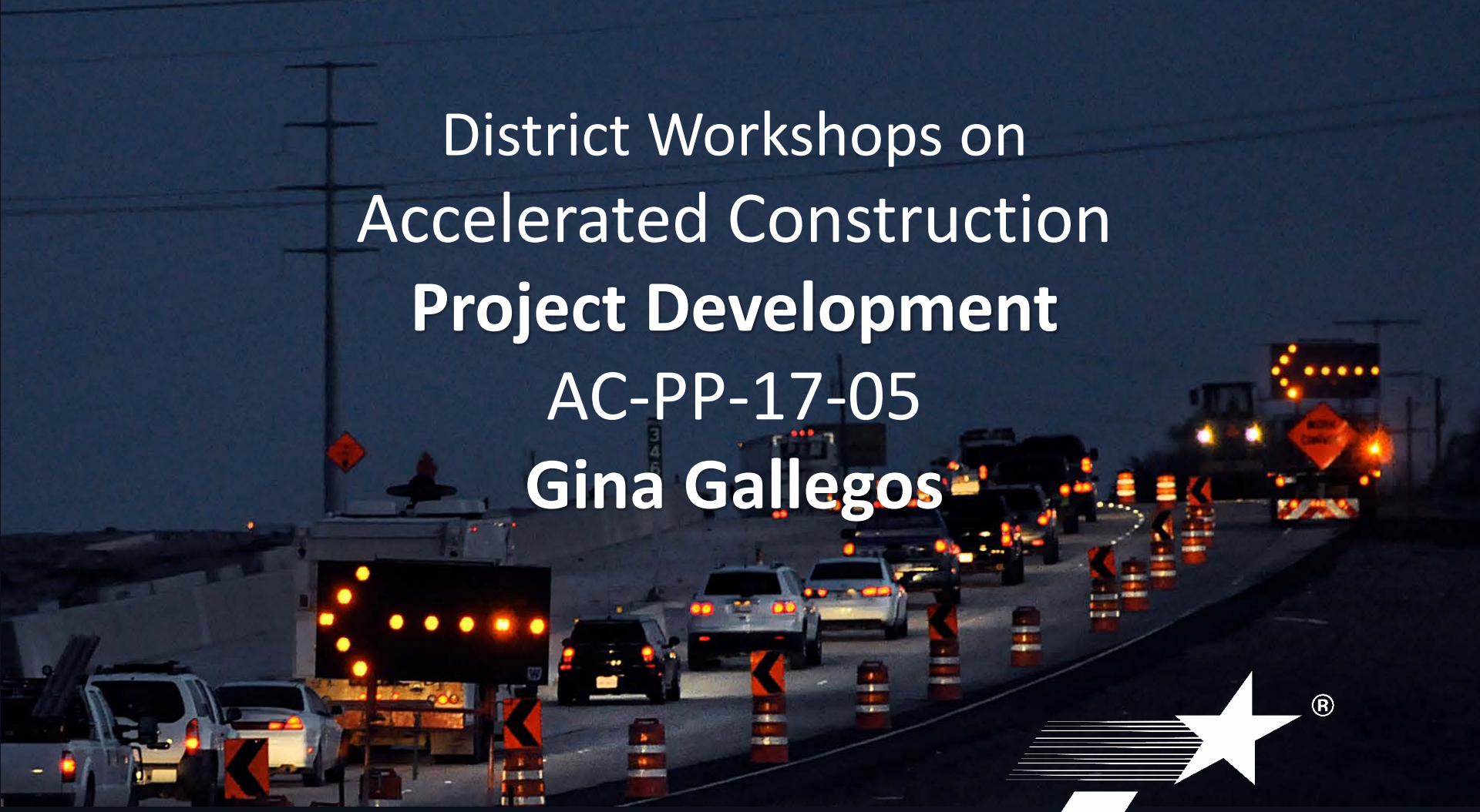
Corpus Christi
Holiday Inn
December 7, 2017

Texas Department of Transportation

Texas A&M Transportation Institute



District Workshops on Accelerated Construction

Project Development

AC-PP-17-05

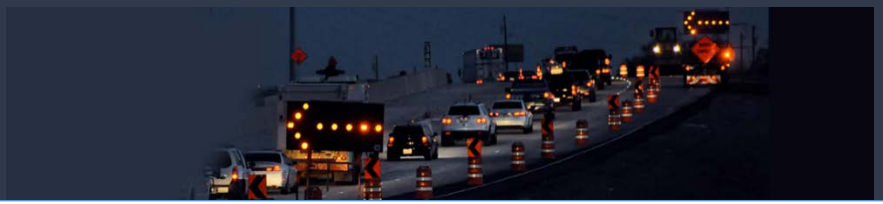
Gina Gallegos

Corpus Christi
Holiday Inn
December 7, 2017

Texas Department of Transportation

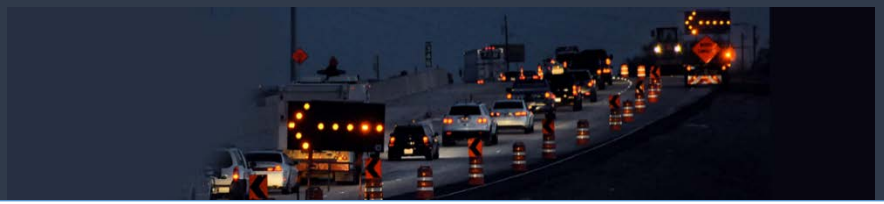
Texas A&M Transportation Institute

OUTLINE



- Project Selection and Planning
- Contracting Methods
- Design
- Contractor Selection
- Involvement of Contractor
- Construction Considerations

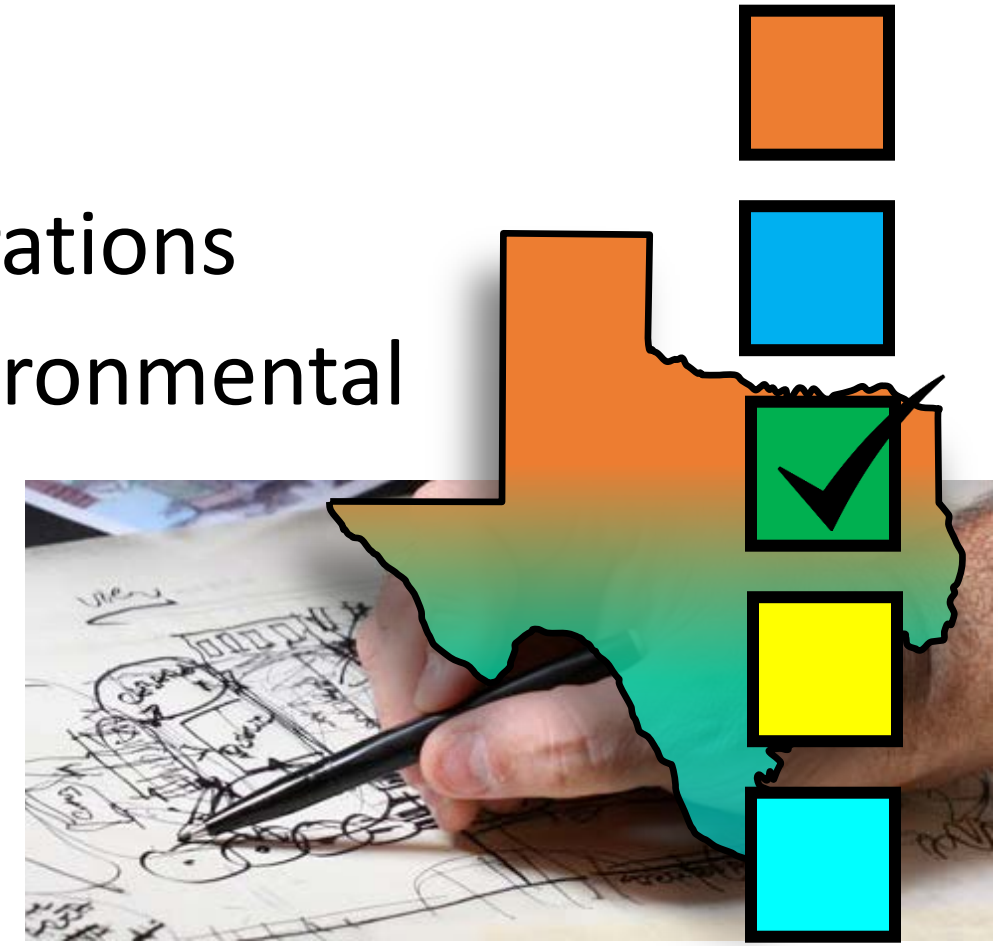
TxDOT RESOURCES



- 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

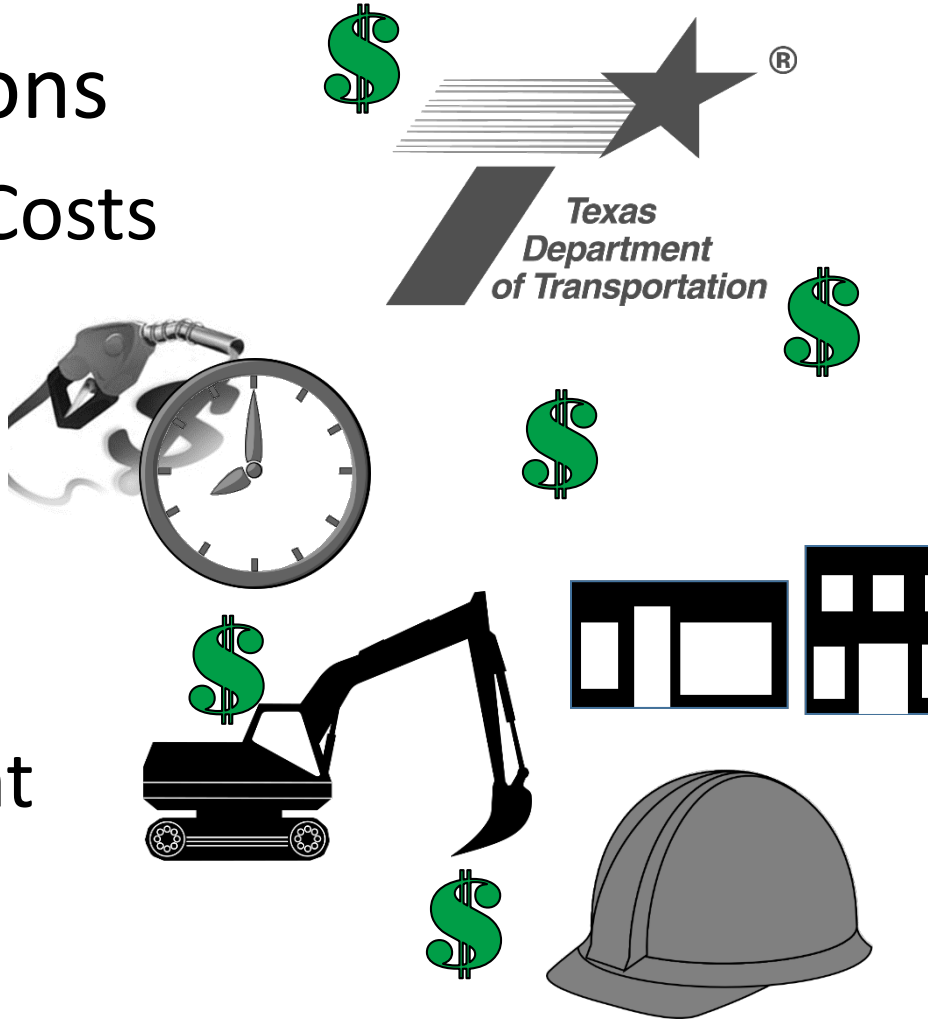
General Guidelines

- 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

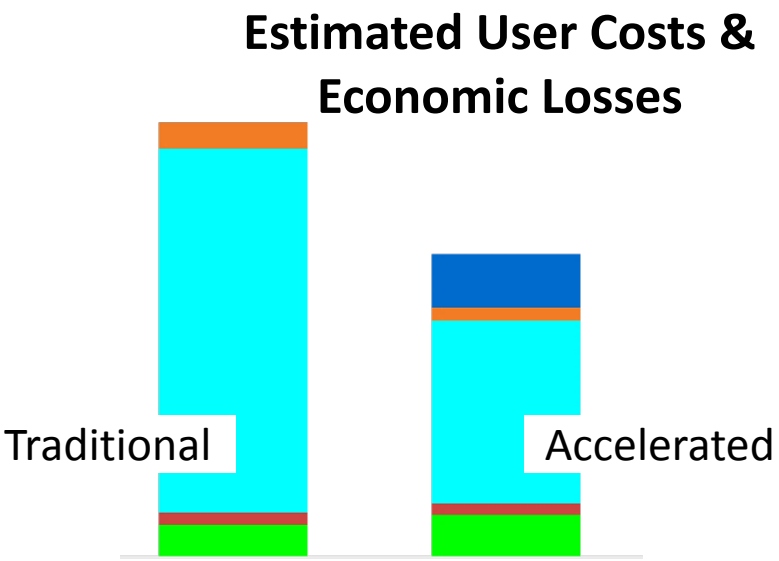
- Agency Administrative Costs
- Road User Costs
- Non-User Costs (adjacent businesses)
- Construction Costs
- Contractor Management Costs



PROJECT SELECTION & PLANNING

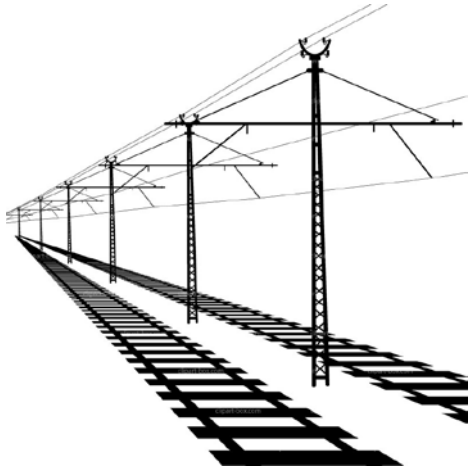
Calculation Tools

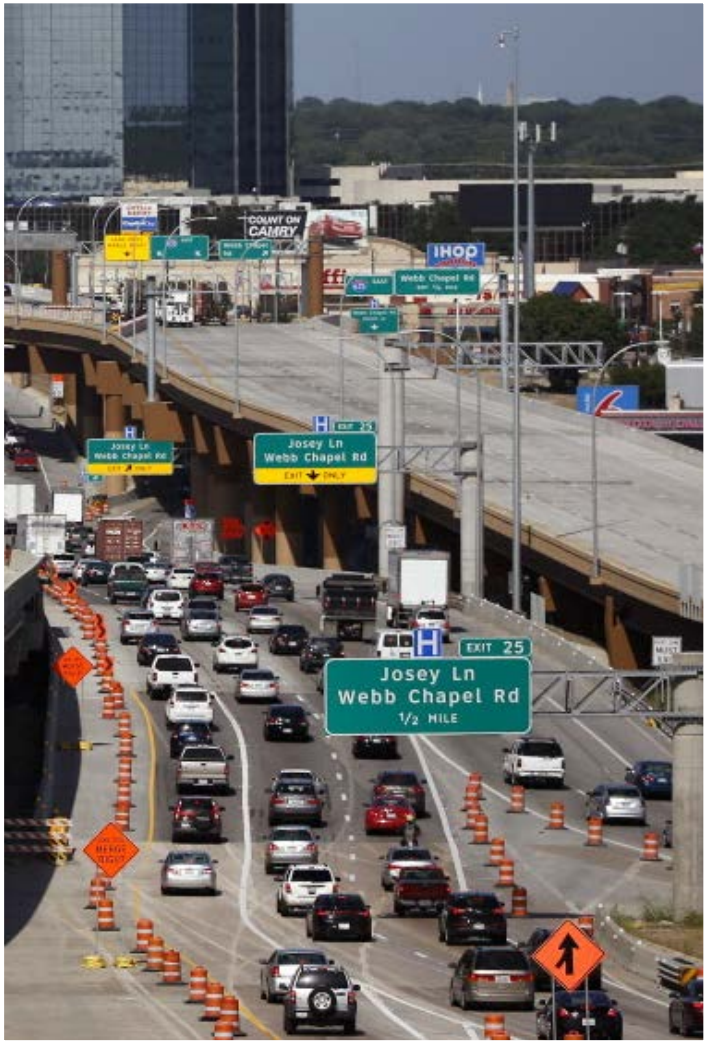
- TxDOT Road User Cost Calculator
- Project Level Economic Screening Tool



PROJECT SELECTION & PLANNING

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

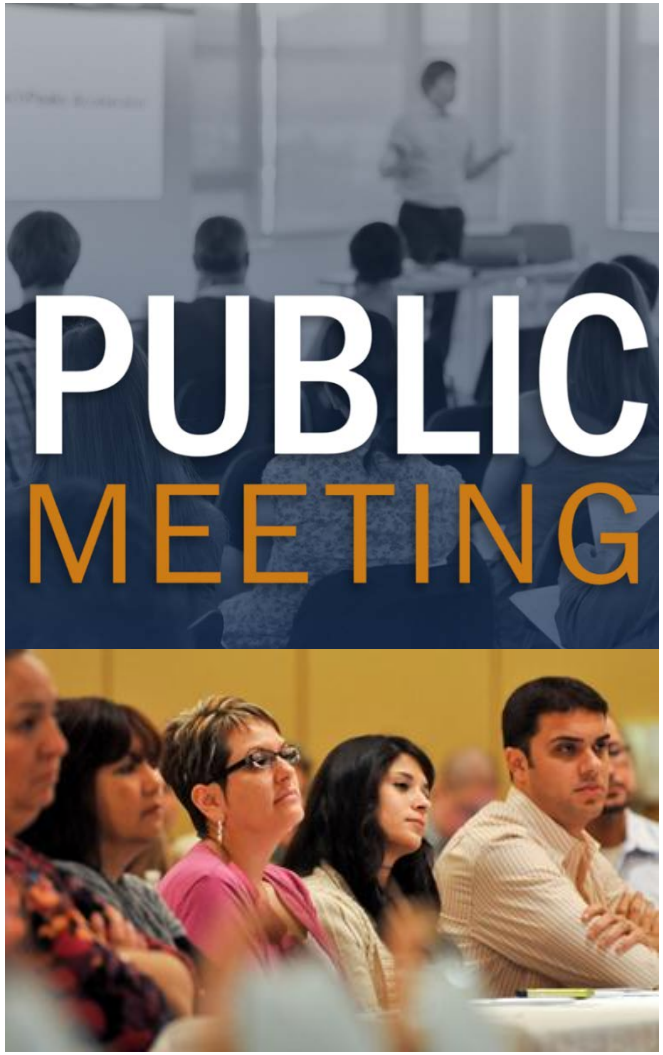




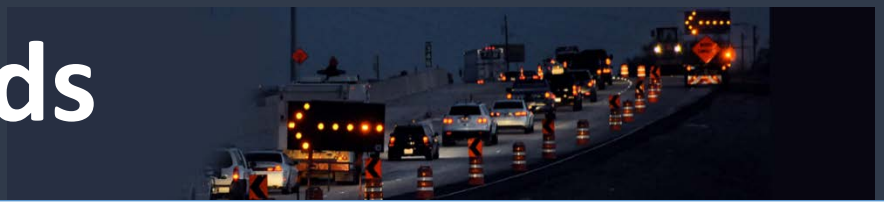
PROJECT SELECTION & PLANNING

Public Information

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

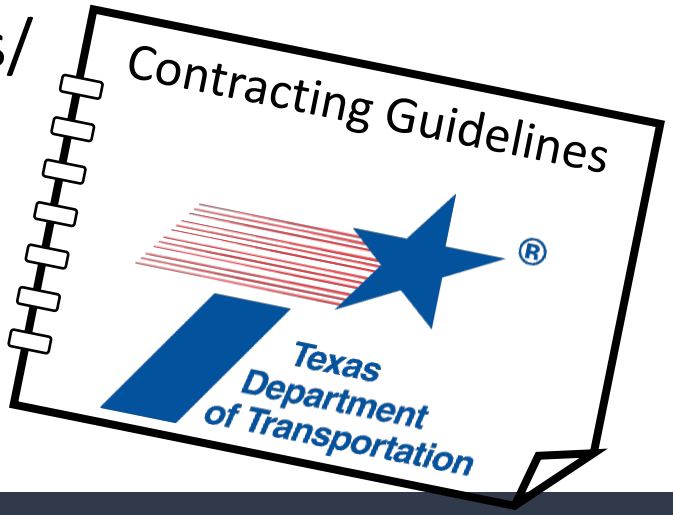


Contracting Methods

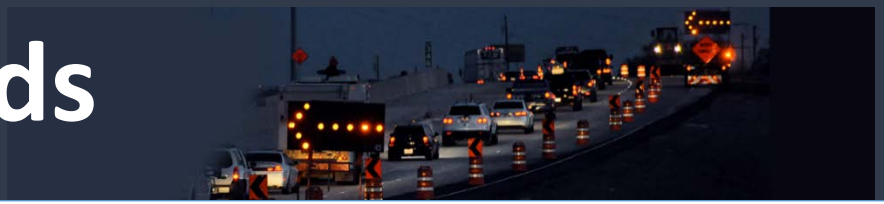


TxDOT Guides

- 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

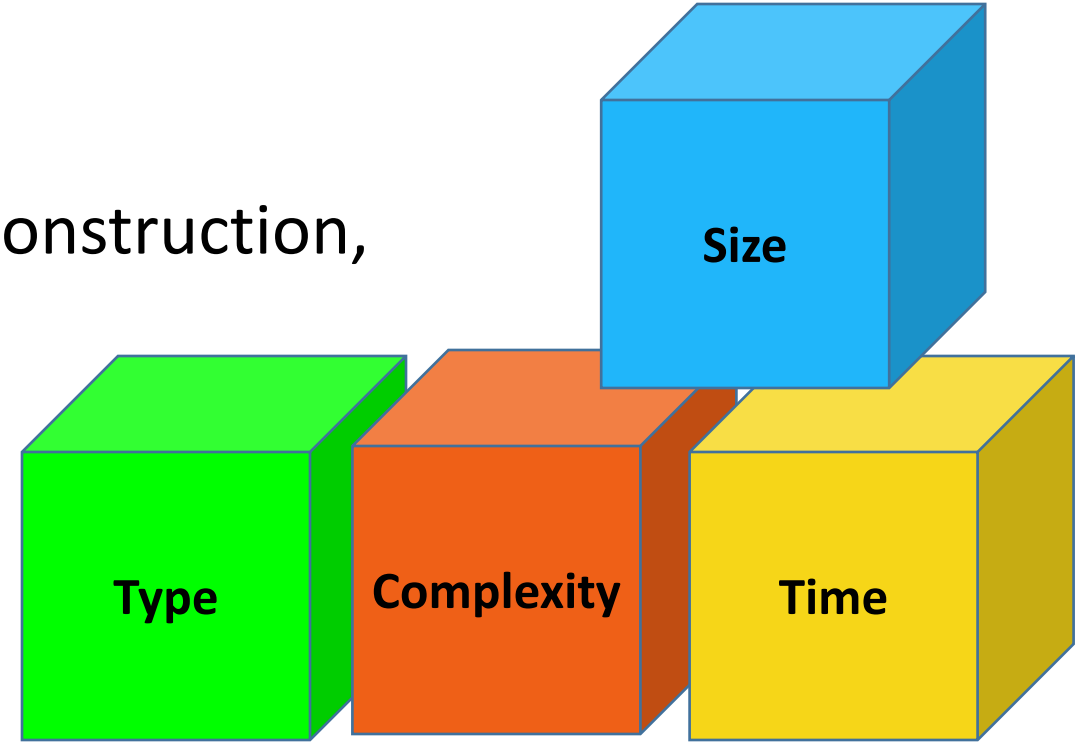


Contracting Methods

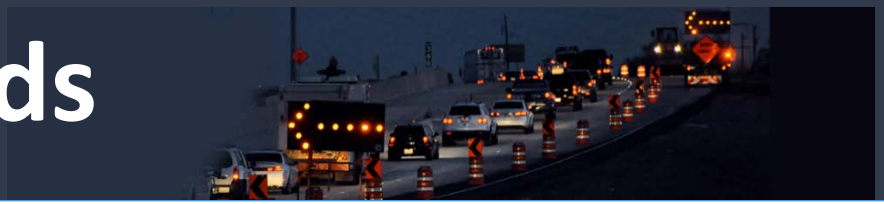


Selection of Contracting Method

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



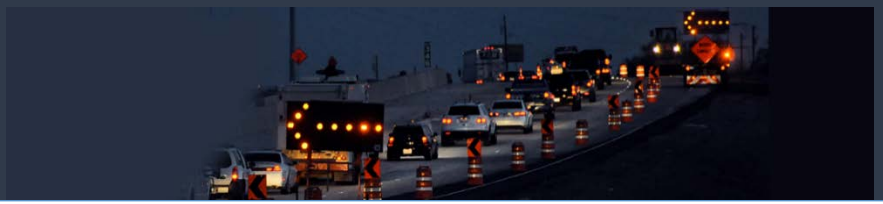
Contracting Methods



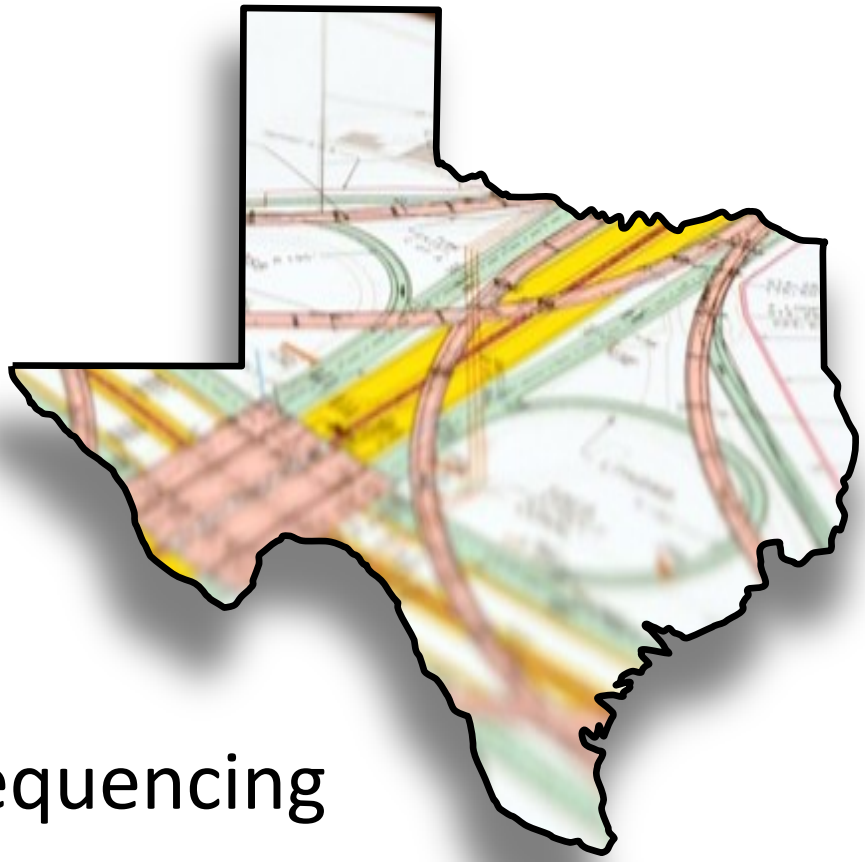
A+B Contracting

- 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

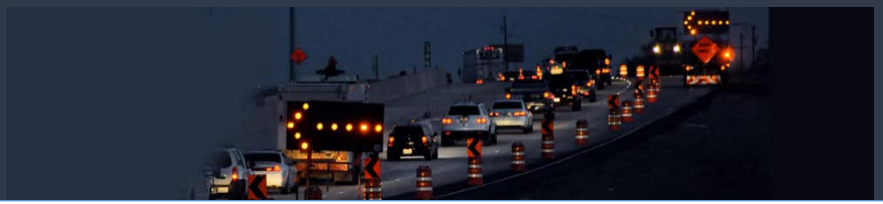
DESIGN



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



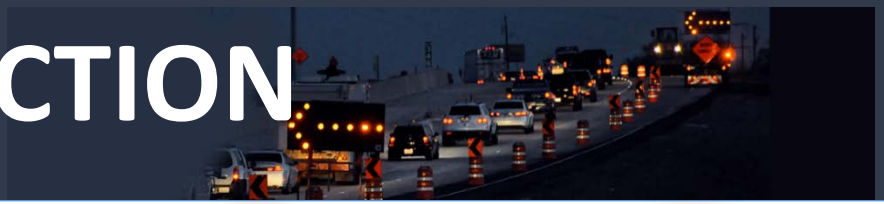
DESIGN



Traffic Control and Job Sequencing

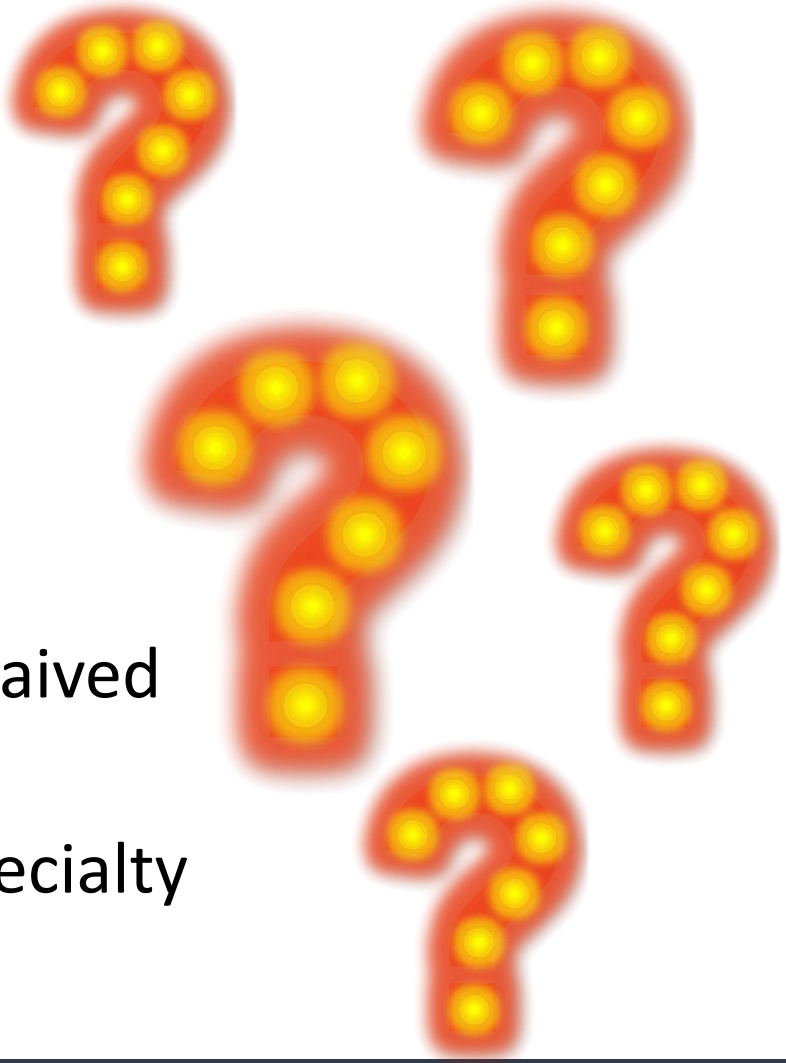
- Texas Manual on Uniform Traffic Control Devices
- Deployment and removal time for traffic control devices
- Design for safety (speed if possible as public will push the speed limits)
- Constructability review

CONTRACTOR SELECTION

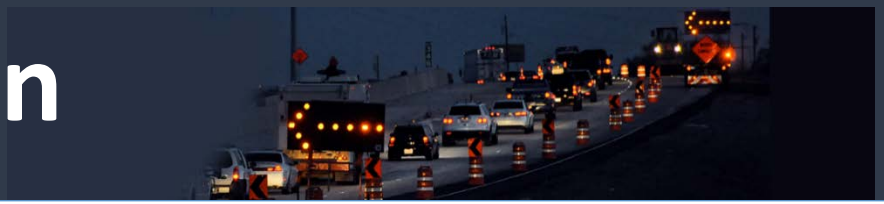


TxDOT Prequalification

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

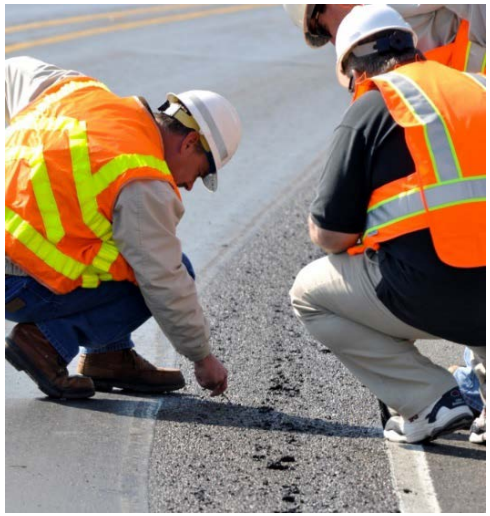


Contractor Selection



Possible Future Considerations

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



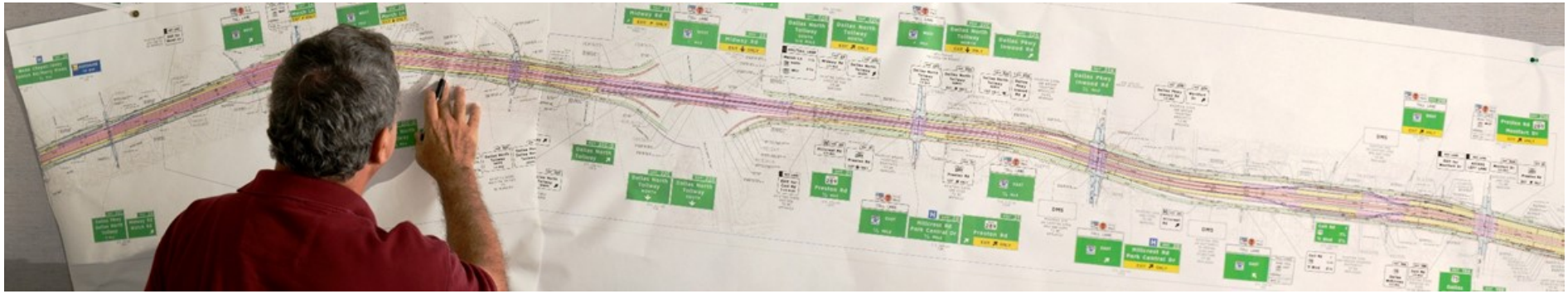
Involvement of Contractor

- 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

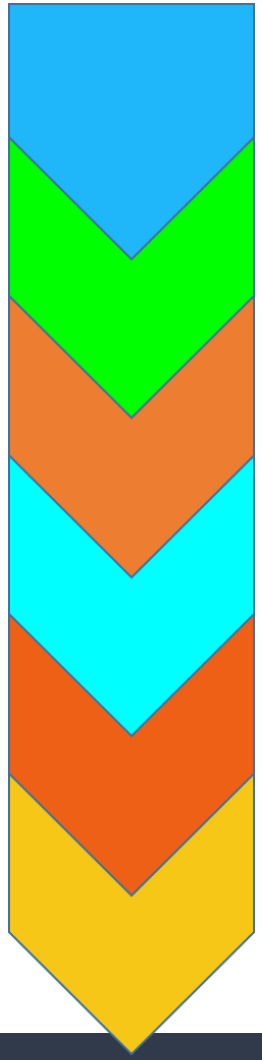
CONSTRUCTION CONSIDERATIONS

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

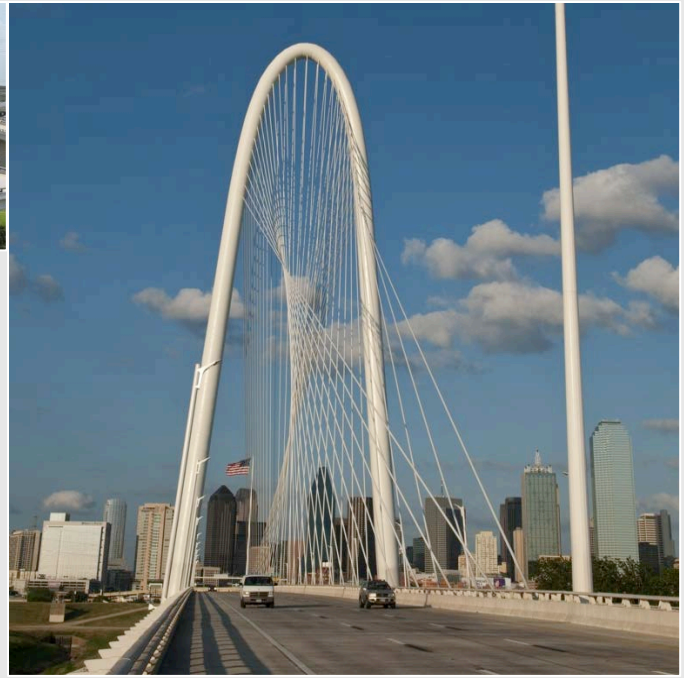
District Workshops on
Accelerated Construction

Corpus Christi
Holiday Inn
December 7, 2017

Texas Department of Transportation

Texas A&M Transportation Institute

ACCELERATED BRIDGE CONSTRUCTION IN TEXAS (AND BEYOND)



Gregg Freeby – Bridge Division

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.

Precast Bent Caps

Precast Bent Caps – Long Water Crossings

Precast Abutments

Precast Columns

TxDOT's Bread & Butter: Girders and Deck Panels

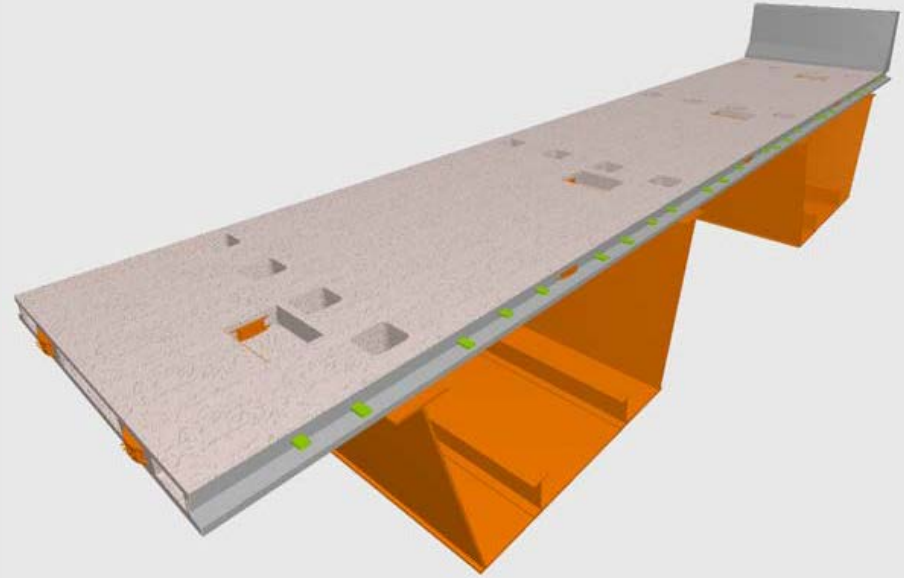
Moving Forward

- 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!

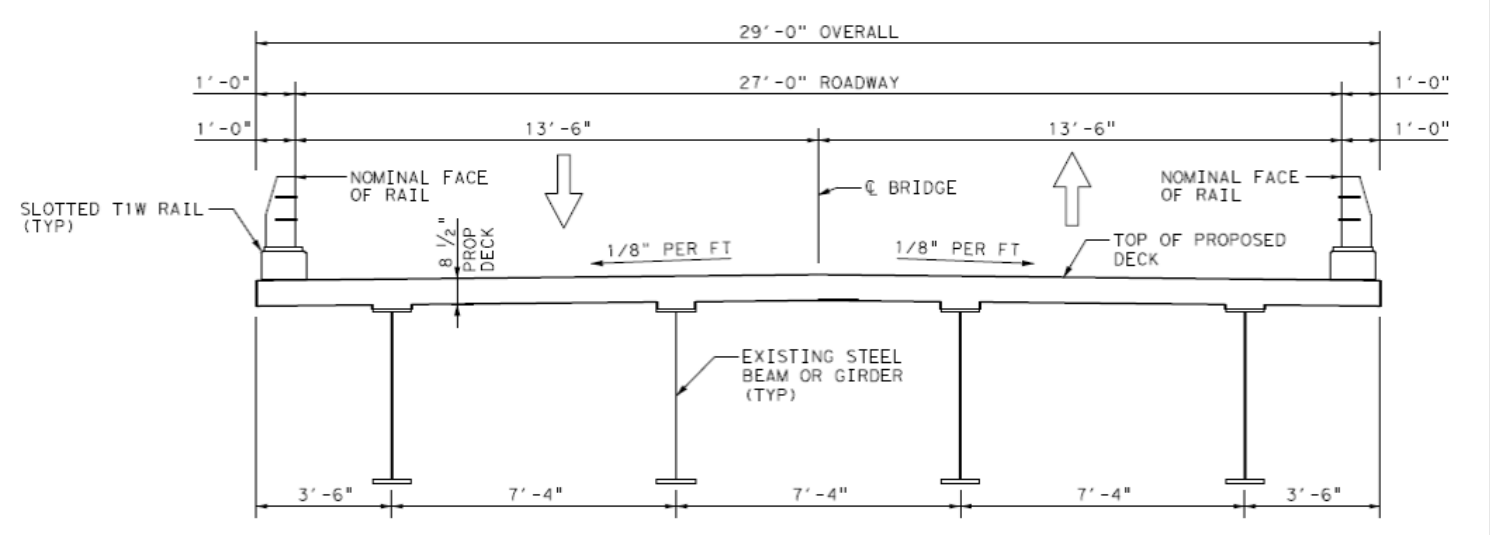
Decked Slab Beams

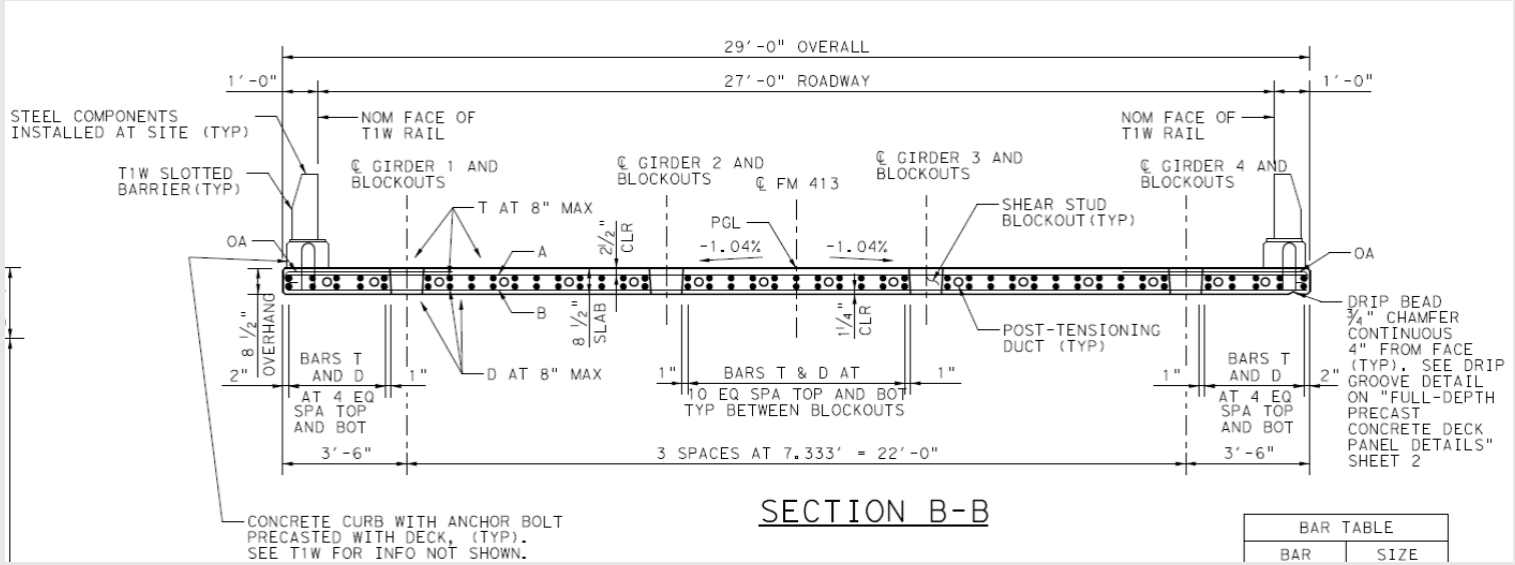
Decked Slab Beams: 6 – 10 Day Construction Projects

Full Width, Full Depth Panels



Full Width, Full Depth Panels – Upcoming Waco Project





Self Propelled Modular Transporters (SPMT)

Photos Courtesy of Heavy Equipment Guide

SPMT – Fort Worth West 7th Street Arches

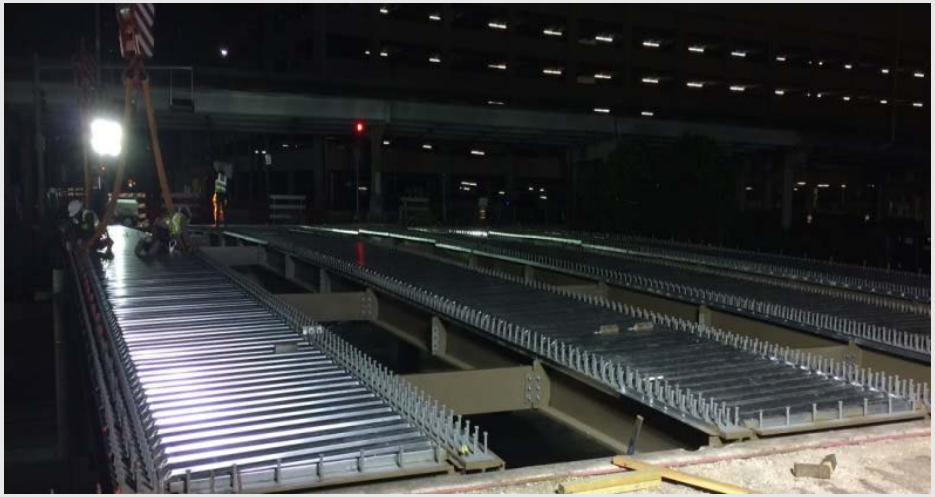
Modular Units

Modular Units – I-93 Fast 14 in Boston

Modular Units – I-93 Fast 14 in Boston

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 (San Antonio)

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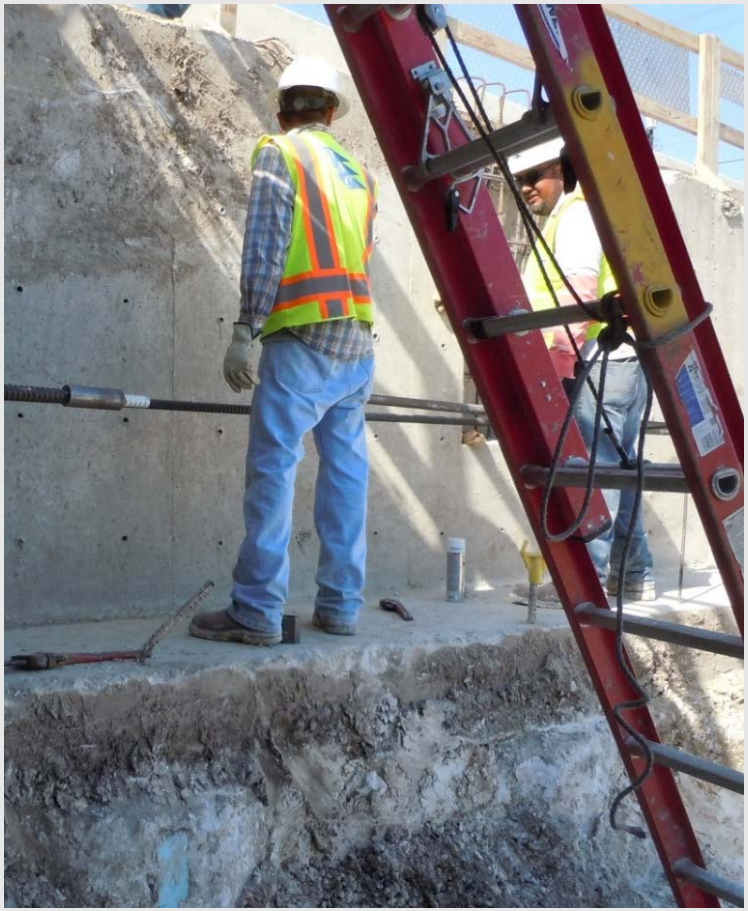
Lateral Slide-in – LP 345 (San Antonio)



QUESTIONS?

Gregg Freeby – Bridge Division

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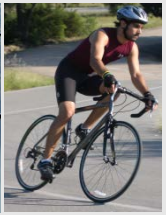
TEXAS DEPARTMENT OF TRANSPORTATION



ACCELERATED CONSTRUCTION STRATEGIES

TRAFFIC AND SAFETY

Date

Accelerated Construction- Traffic and Safety

- The public comes first (for both TxDOT and the contractor)
- Only so many contractors in area.
- Only so many qualified skilled personnel (welders, machine operators, electricians, etc.)
- Only so many pieces of equipment.
- Only so many natural resources (aggregates, concrete, base material).
- Accelerate projects from a calendar day standpoint, not a days charge versus completion standpoint.

Accelerated Construction- Traffic and Safety

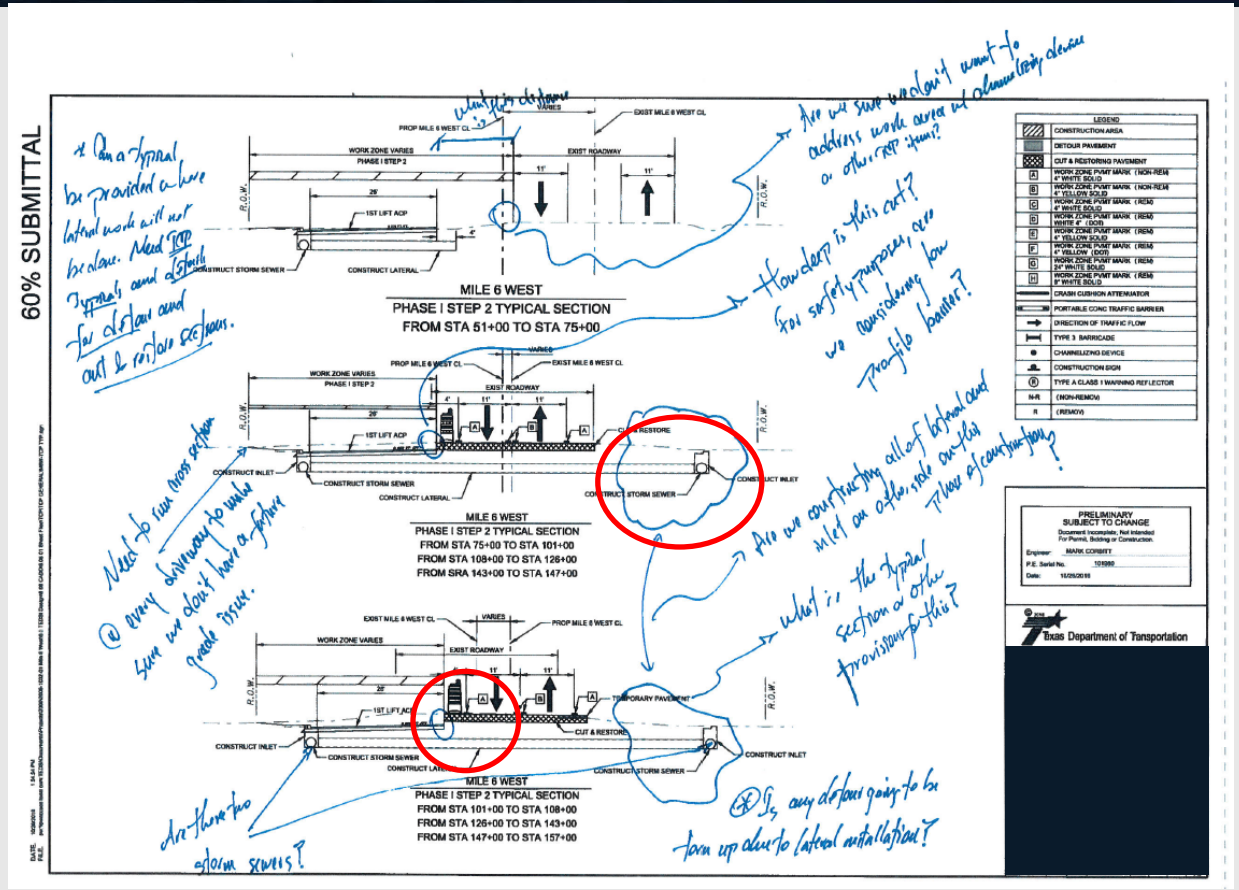
- Project completion is highly dependent on the project's TCP, which is highly dependent on the project's pavement design.
- Pharr has a DSRT committee to review all district TCPs.
- Members include:
  - Director of Construction (Chair)
  - Director of Traffic Operations (Co-Chair)
  - District Design Engineer
  - District Traffic Engineer and TCP Coordinator
  - District Construction Engineer
  - District Chief Inspector
  - A seasoned Project Manager
  - Project Design Engineer

Accelerated Construction- Traffic and Safety

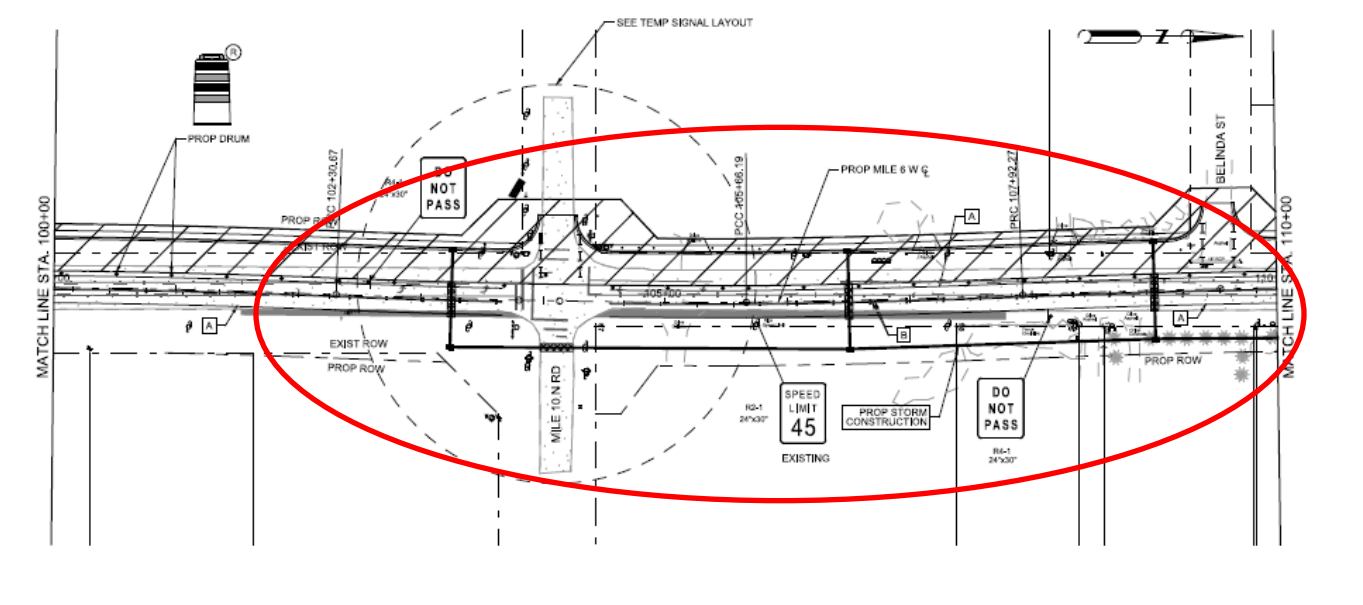
- Main Items are safety related (Impacts to the public and OUR workers):
  - Large drop offs (is barrier warranted?)
  - Deep excavations
  - Exposed personnel in work zone
  - Proper signage for roadway condition
  - Expedition of work at intersections or congested areas
  - Possible speed reductions
  - Placement of chevrons or portable message signs

Accelerated Construction- Traffic and Safety

Accelerated Construction- Traffic and Safety

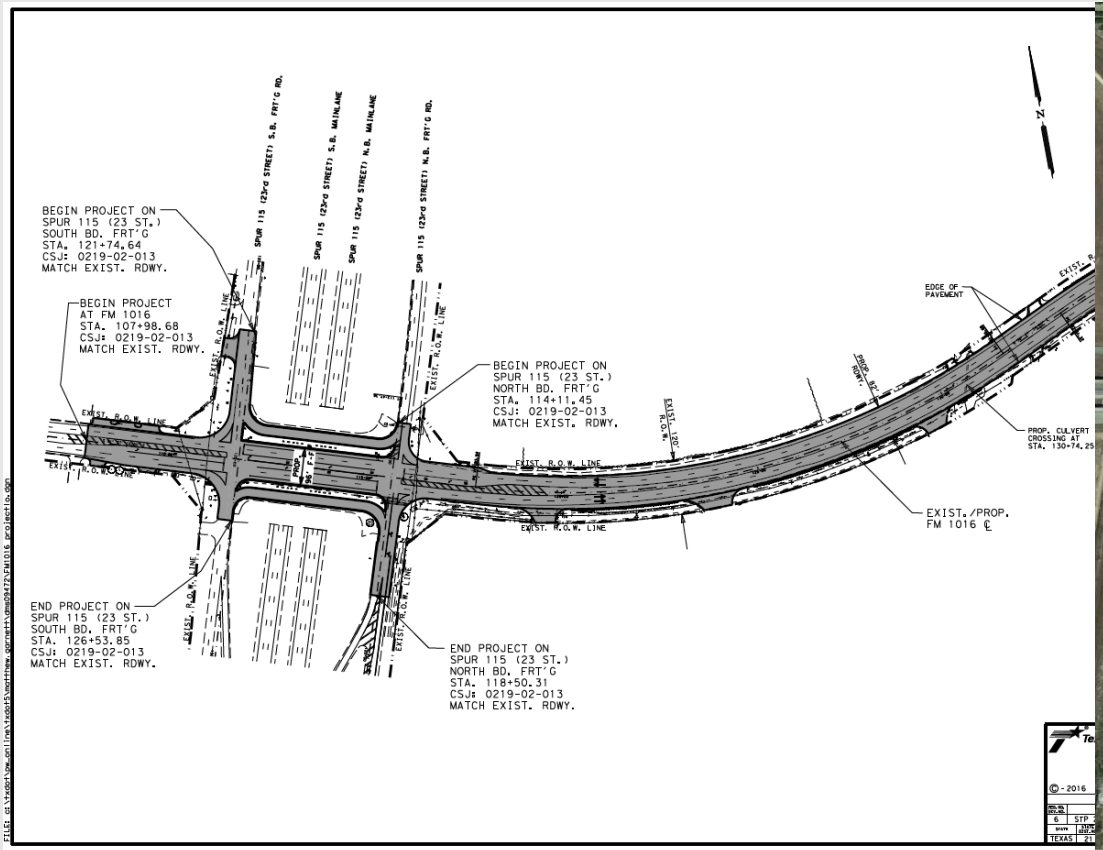


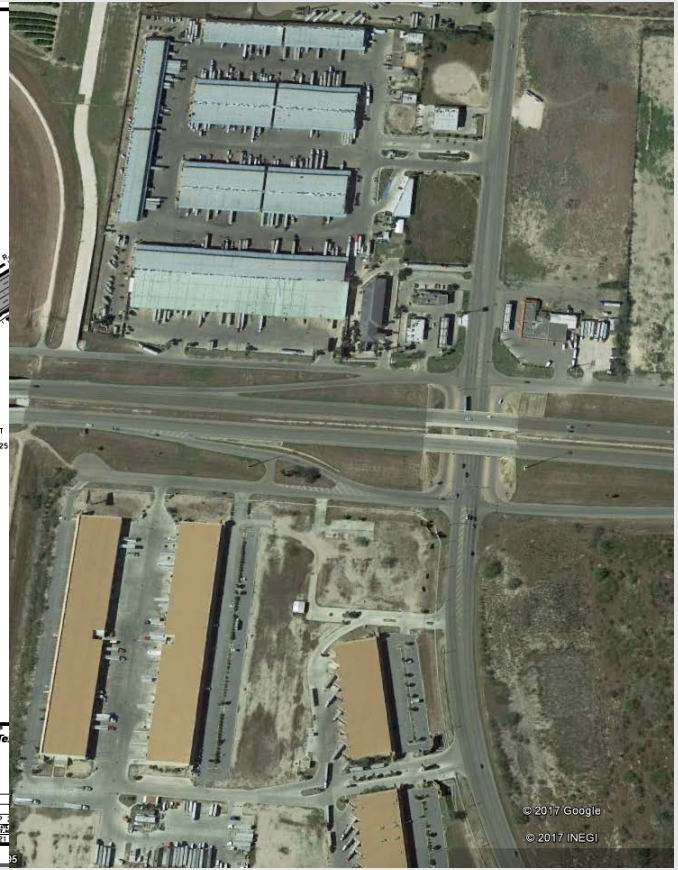
Accelerated Construction- Traffic and Safety



Exposed workers and a unprotected deep excavation was identified during DSRT review.

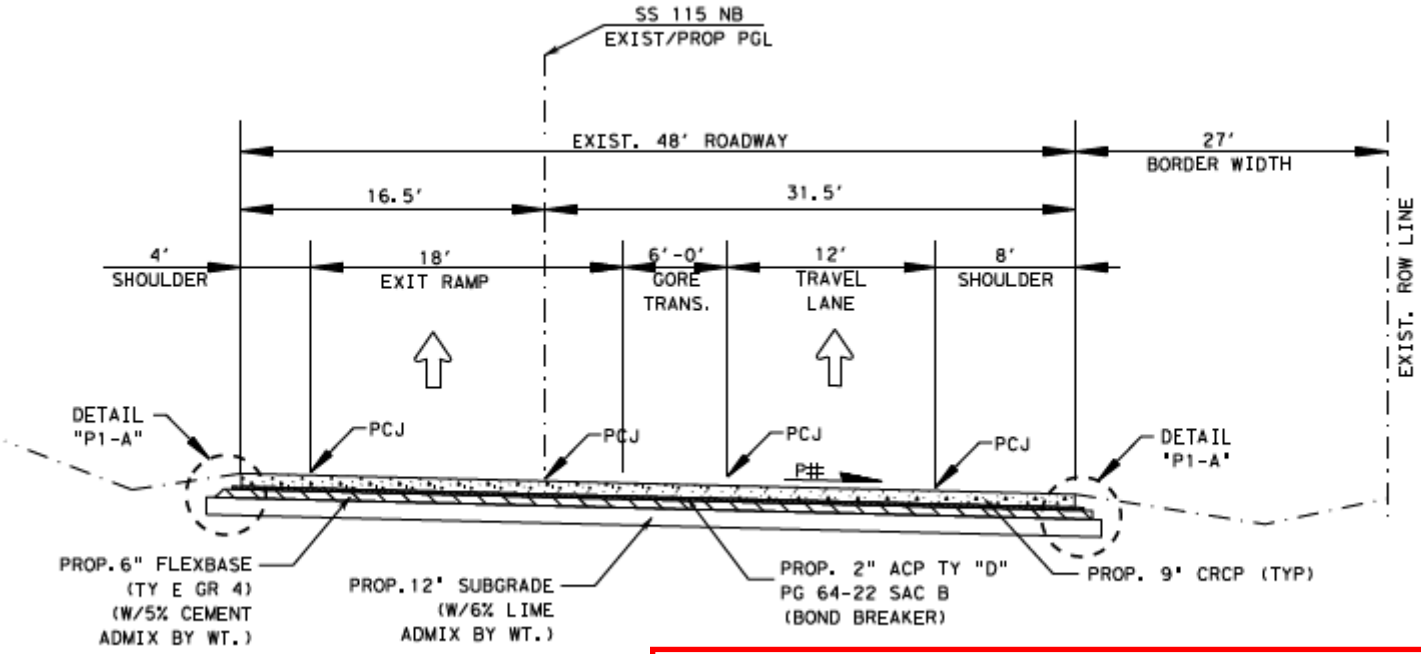
Accelerated Construction- Traffic and Safety





Accelerated Construction- Traffic and Safety

Accelerated Construction- Traffic and Safety



9.0" CONTIOUSLY REINFORCED CONCRETE PAVEMENT
4.0" ACP TY D PG 64-22 SAC B
PROOF ROLL SUBGRADE

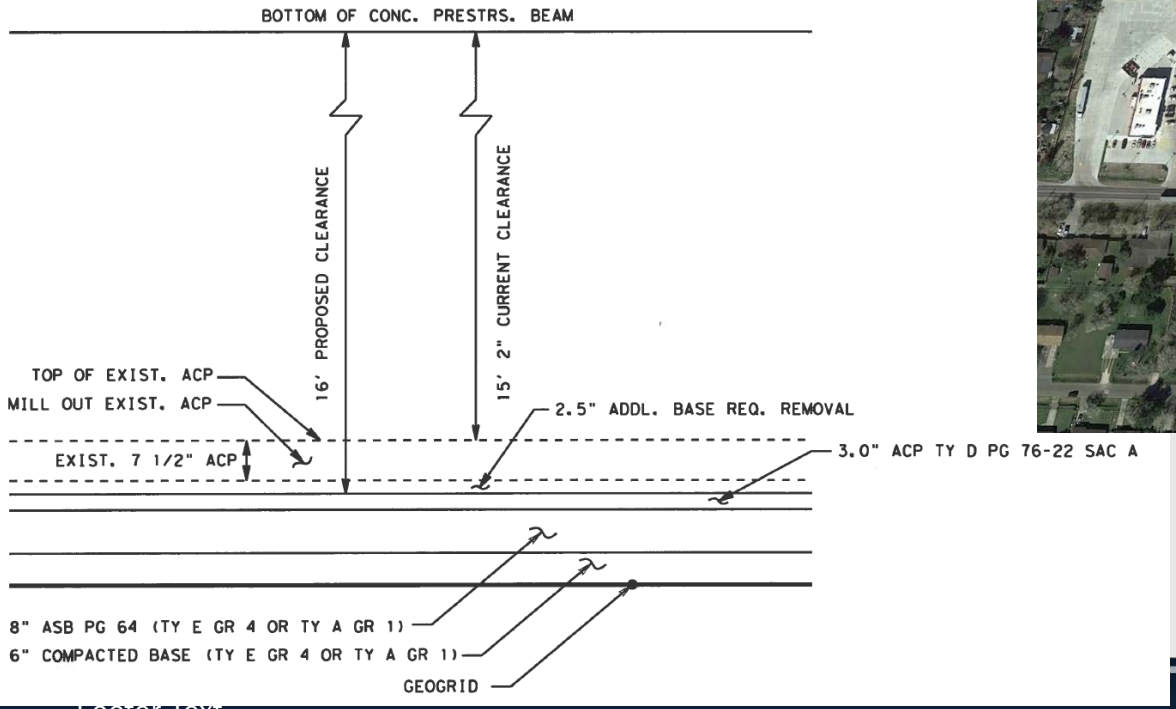
Accelerated Construction- Traffic and Safety

ID		Task Mode	Task Name	Duration	Start	Finish	Predecessor
1			**FM 1016 HIDALGO COUNTY**				
2			**FM 1016 AND SPUR 115**				
3			**CSJ: 0219-02-013**	**378 days**	**Mon 2/13/17**	**Mon 10/1/18**	
4			PRECONSTRUCTION PHOTOS/VIDEO	9 days	Mon 2/13/17	Mon 2/27/17	
5			SW3P	4 days	Mon 3/6/17	Fri 3/10/17	4
6			MOBILIZA				
7			**PHASE 1**				
8			**TRAFFI**				
9			CON				
10			CON				
11			TEM				
12			CON				
13			INST				
14			MILLING				
15			ROADW				

From 378 days to 320 days

ID		Task Mode	Task Name	Duration	Start	Finish
1			**STATE HIGHWAY IMPROVEMENT**			
2			**FM 1016 HIDALGO COUNTY**			
3			**FM 1016 AND SPUR 115**			
4			CSJ: 0219-02-013	319.35 days	Mon 5/1/17	Thu 11/8/18
5			PRECONSTRUCTION PHOTOS/VIDEO	1 day	Mon 5/1/17	Tue 5/2/17
6			SW3P	1 day	Mon 5/1/17	Tue 5/2/17
7			MOBILIZATION	2 days	Mon 5/1/17	Wed 5/3/17
8			**PHASE I**	**236.95 days**	**Wed 5/3/17**	**Thu 6/21/1**
9			PHASE I STEP 1	16 days	Wed 5/3/17	Tue 5/30/17
10			TRAFFIC CONTROL	1 day	Mon 5/1/17	Tue 5/2/17

Accelerated Construction- Traffic and Safety



Accelerated Construction- Traffic and Safety

- ITEM 292: Asphalt Treatment (Plant- Mixed)

- Design will be based on Tex- 204-F using the Superpave Gyratory Compactor. Design the mixture at 100 gyrations. (Ndesign) Use a target laboratory-molded density of 96%. Use an Asphalt Content between 3% and 9%.

- Place asphalt treated base in layers between 3 to 4 inches.

- Use Flexible Base TY E GR 4 in accordance with item 247. TY A GR 1 may be used in lieu of TY E GR 4 when approved by the engineer.

- Compact asphalt treated base to 91.2%. (95% of lab molded density)

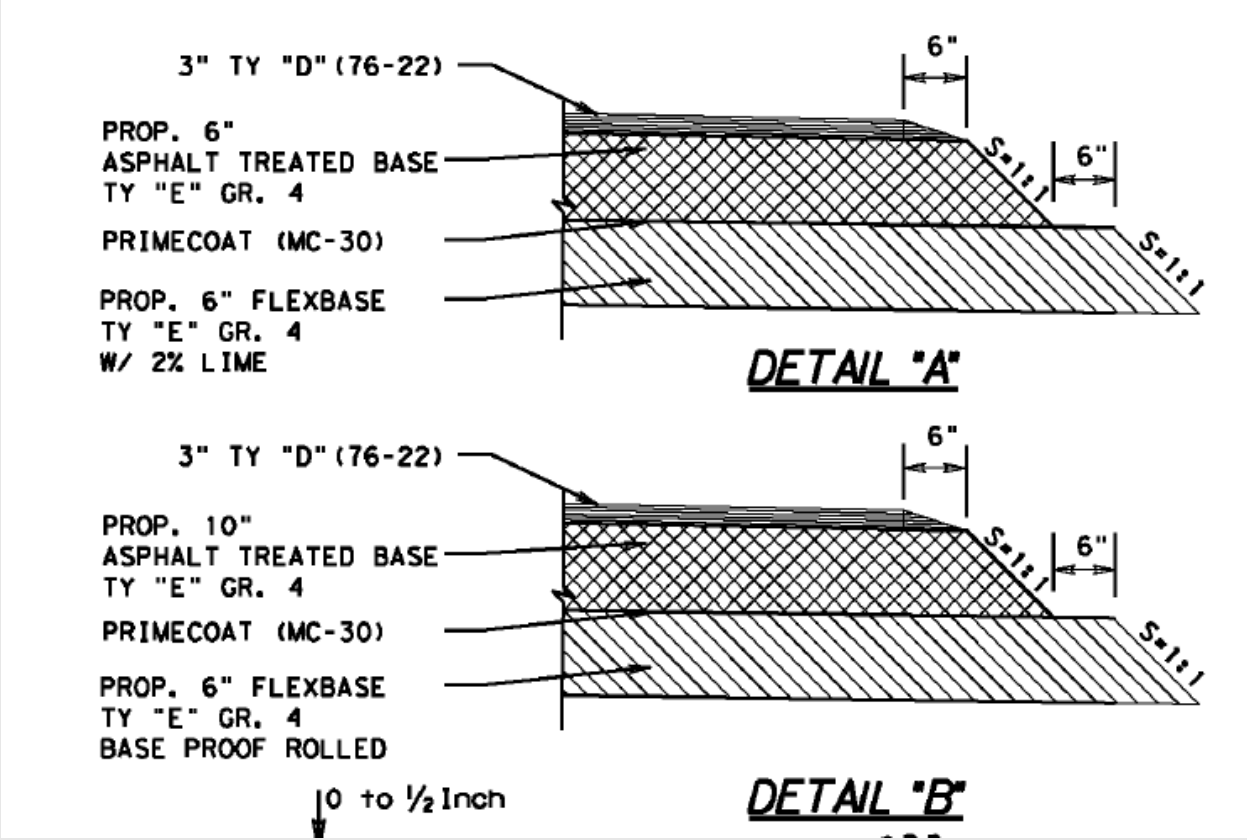
- Perform base ride quality testing before placing ACP in accordance with Item 247.

Accelerated Construction- Traffic and Safety

Accelerated Construction- Traffic and Safety

Accelerated Construction- Traffic and Safety

Accelerated Construction- Traffic and Safety



Accelerated Construction- Traffic and Safety

- FM 1925 Foremost Paving
- 100% complete on work items
- 67% complete on time
- **Contractor finished 6 months ahead of schedule!!**
- Designs utilizing ASB have a modulus of 250-300 KSI.
- FWD test results on several ASB locations indicate a modulus ranging from 800 KSI-1000 KSI.

Accelerated Construction- Traffic and Safety

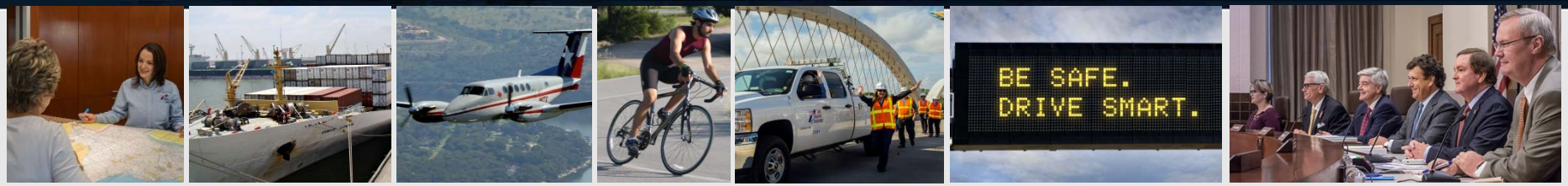
- Our district will have a **zero tolerance policy** on the following items:
  - **Eminent safety risks to our employees and contractor employees.** This includes lack of trench protection, lack of fall protection, missing key pieces of traffic control devices such as TMA's, inoperative backup alarms, etc.
  - **Eminent safety risks to the traveling public.** This includes excessive drop offs that do not have a maintained 3:1 slope, exposed excavations within 30 feet of the travel lanes, not using stop slow paddles when needed, etc. Any safety shortcomings as a result of the plans will be handled accordingly and possibly through change order if needed.

Accelerated Construction- Traffic and Safety

Accelerated Construction- Traffic and Safety

QUESTIONS?

TEXAS DEPARTMENT OF TRANSPORTATION



ACCELERATED CONSTRUCTION WORKSHOP

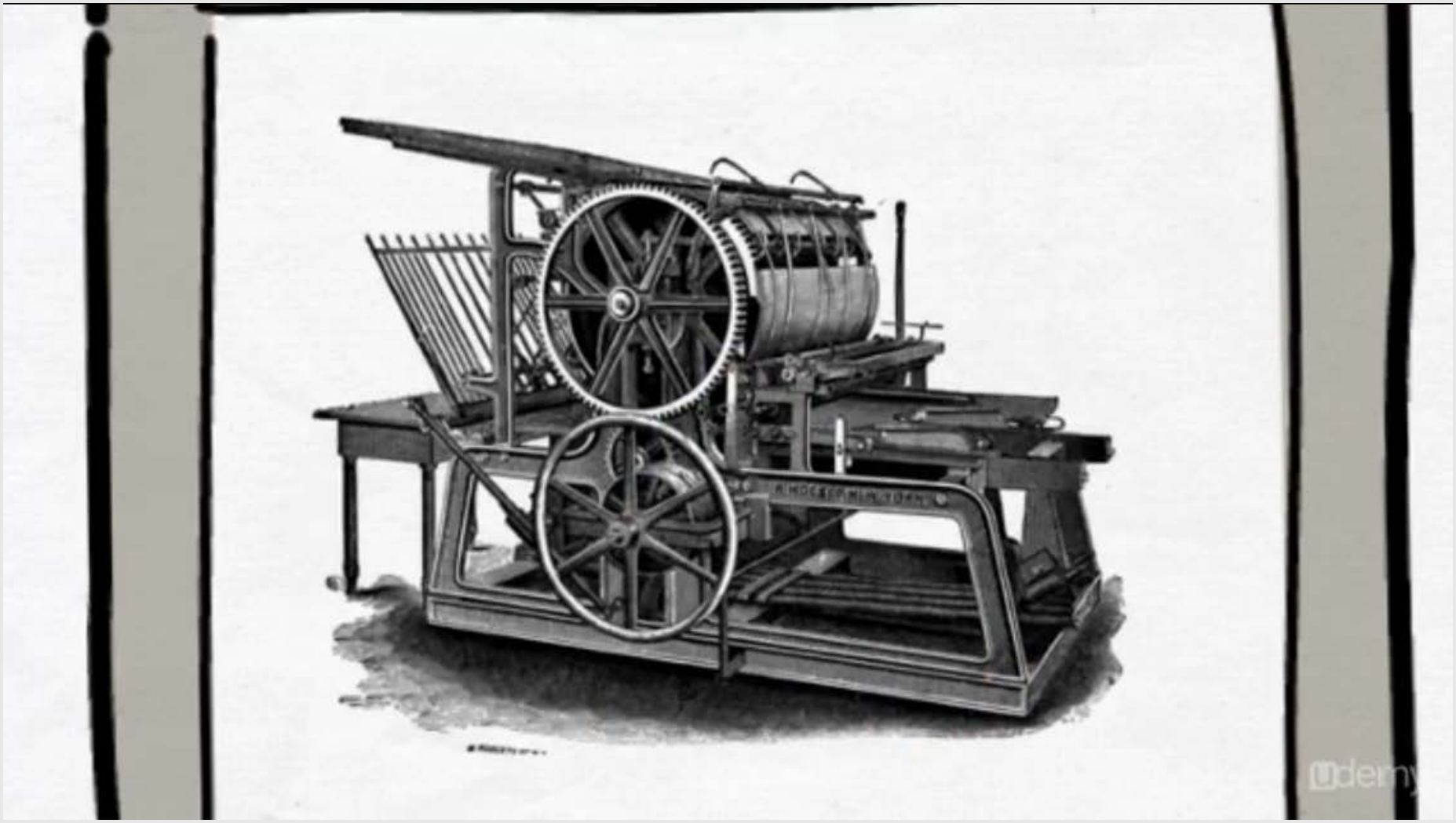
PUBLIC INFORMATION

December 8, 2017

THE RELATIVELY UNRESTRICTED CIRCULATION OF INFORMATION AND REVOLUTIONARY IDEAS TRANSCENDED BORDERS, CAPTURED THE MASSES IN THE REFORMATION AND THREATENED THE POWER OF POLITICAL AND RELIGIOUS AUTHORITIES; THE SHARP INCREASE IN LITERACY BROKE THE MONOPOLY OF THE RICH ON EDUCATION AND LEARNING AND LED TO THE EMERGING OF THE MIDDLE CLASS.

To what is this person referring to?

The Printing Press



WHAT IS TASTIER?

How can we make our messages tastier?

Get more word of mouth for us?

CHANGES IN PUBLIC INFORMATION

Old media was mainly an intrusive one way communication model.

Press release was main medium for emergency managers to release critical info.

News cycle was slower allowing for a controlled message content & timing.

CHANGE IN CYCLES

The news media moved to a 24-hour cycle and access to media at the site of a disaster event became more accessible and immediate.

Now social media sites allow average citizens to post text, pictures, video, and links that disperse content quickly and widely.

Communication Style & Characteristics

Traditional Written

- Permanent or Semi-permanent
- Formal
- Lacks responsiveness
- Less emotional
- Costly in time and resources to create
- Rigid
- Unlikely to be distorted

- Social Media

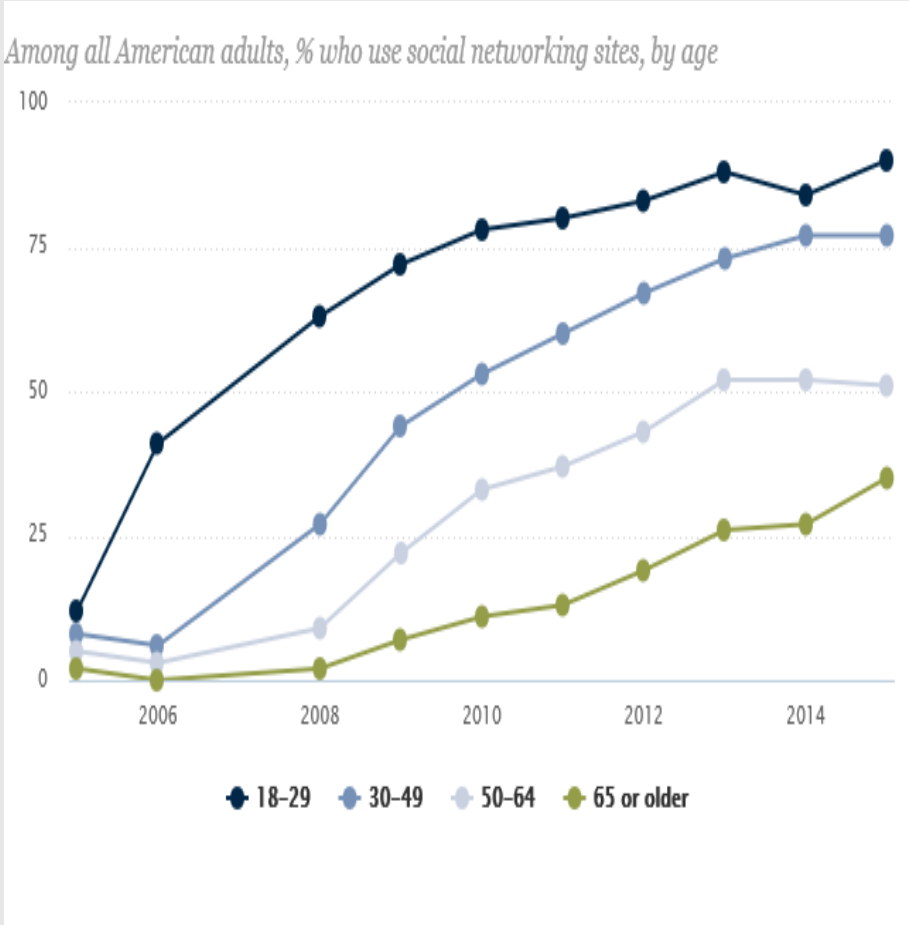
- Permanent or Semi-permanent
- Informal
- Responsive
- Can include emotional appeal
- Low cost in time and resources
- Somewhat flexible
- Potential for distortion

- Traditional Verbal

- Not Permanent
- Informal
- Highly Responsive
- Can Include emotional appeal
- Low cost in time and resources
- Flexible
- Potential for distortion

Based on http://thebusinesscommunication.com/difference-between-oral-and-written-communication/

Social Media Use is Rising



Social Media usage 2015:

- 90% of adults 18-29 yrs.
- 77% of adults 30-49 yrs.
- 51% of adults 50-64 yrs.

52% of online adults use multiple Social Media sites

70% of Facebook users engage daily

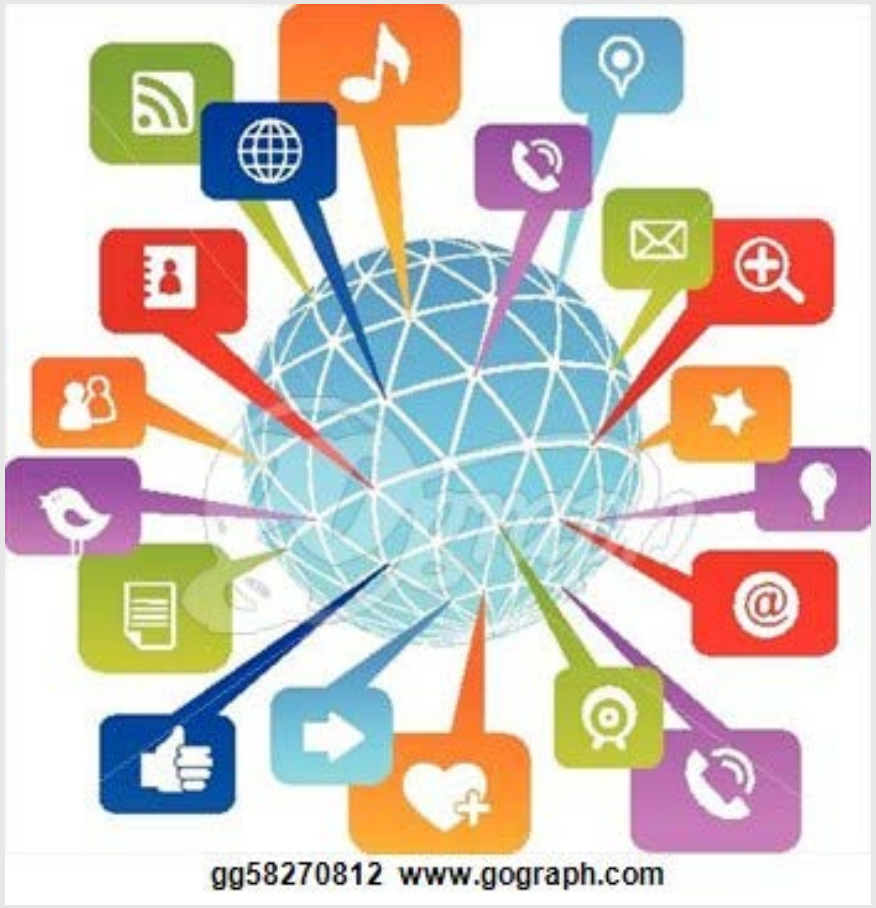
45% of Facebook users engage multiple times per day

Andrew Perrin. "Social Networking Usage: 2005-2015." Pew Research Center. October 2015. Available at: http://www.pewinternet.org/2015/10/08/2015/Social-Networking-Usage-2005-2015/

Duggan, M., Ellison, et. al. "Social Media Update 2014," Pew Research Center, January 2015. Available at: http://www.pewinternet.org/2015/01/09/social-media-update-2014

Important Characteristics of Social Media Technology

- Communicative in Nature
- Easy to Generate Content
- Easy to Share & Re-share Information
- High Speed
- Widely Accessible
- Low Resource/Cost Investment
- Multimedia (photographic, text, video)
- Long Data-Retention
- Informal/Conversational



WHEN SHOULD WE INFORM?

Does your project change someone's daily commute?

YES?

Then it should be addressed via press release or Twitter through your PIO or Media Relations Expert.

Why use Social Media?

Social media is becoming many people's primary source of news, opinion, and entertainment

Social media is now ubiquitous -- widespread blogging, social networks, video sharing sites, and opportunities to comment on and rate online content

Power of personal connections -- Research shows people are more compelled to act on information that's transmitted through personal ties

Relevancy for government – We can use social media to share timely government information with the people who need it

Engaging citizens to improve government -- Social media allows people to engage, to provide input for improving government services, and be part of the democratic process

WHAT IS TWITTER?

A lot of people publicly at once

Specific person publicly

Specific person privately

Twitter is a “micro-blogging” platform that limits you to short bursts of information.

Allows for rapid fire sharing of concise information

UNEXPECTED APPLICATIONS

In an emergency, people will come to your web site en masse to the point where servers are compromised.

Twitter helps the continuity of operations.

How Do You Reach Them?

- Not just a numbers game.
- Create Relationships.
- One tweet. One Positive Result. One Rapport
- 5 Ps of Marketing

OPPORTUNITIES for SELF PROMOTING

Speed: Doing things quickly; eliminating the middleman, noise and filters between those who have information and those who need or can use it (note: bi- and multi-directional communication).

Relevance: Doing the right thing; getting the right message to the right audience; focusing on influencers and interested followers in a position to act (such as public vs. media, partners, etc.)

Accuracy: Doing things right; ensuring that information is correct, confirmed by independent sources and backed up by facts or direct observation.

THANK YOU

ACCELERATED CONSTRUCTION

ACCELERATED CONSTRUCTION WORKSHOP - CORPUS CHRISTI, TEXAS

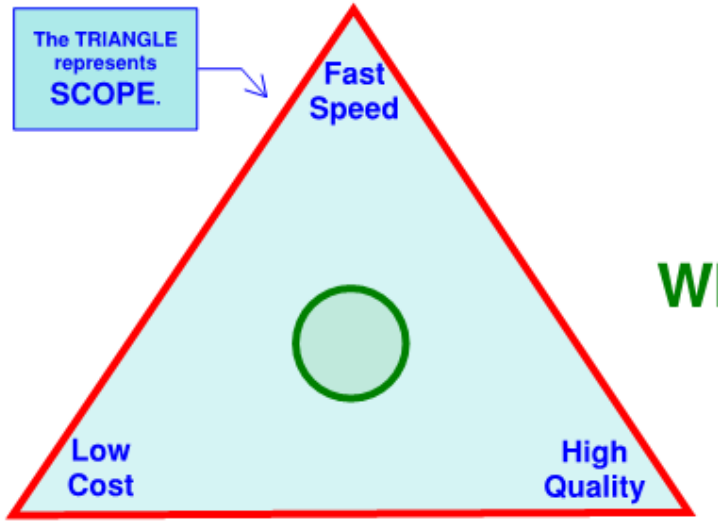
RANDALL MOORE HAAS-ANDERSON CONSTRUCTION, LTD.

DECEMBER 7, 2017

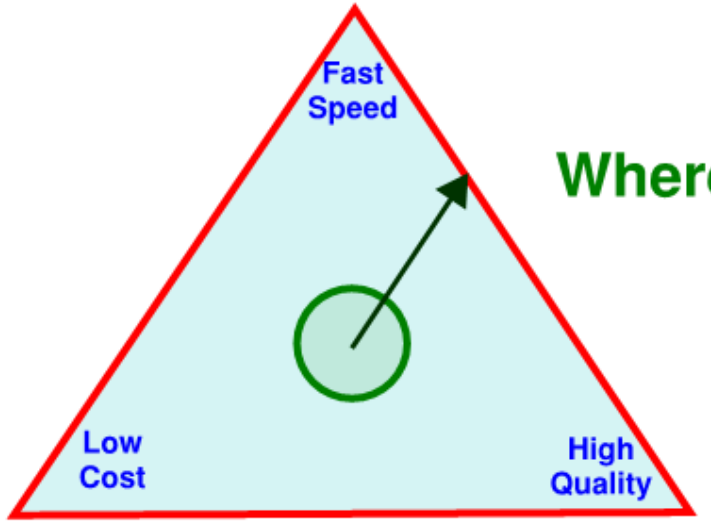
Thank You TxDOT for all Your HELP!!

First Thoughts……

The "Traditional Middle Ground"

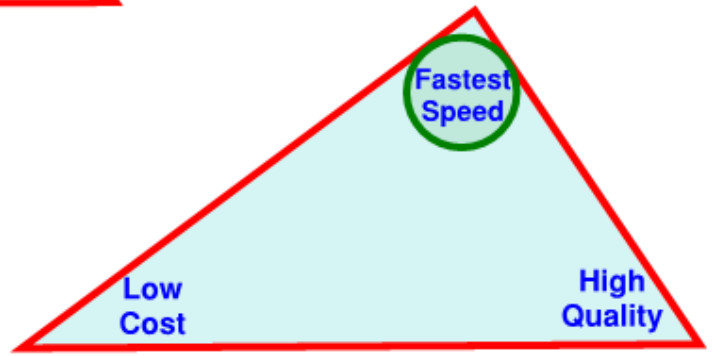


Where we are now.....



Where TxDOT wants to go.....

What must happen to get there.



What can we expect from Accelerated Construction that Maintains Project Quality (and Safety)…..?

INCREASE IN CONSTRUCTION COST

Change in Scope

SCOPE……What could Possibly Change?

1. The Scope of Project Type
2. The Scope of the Team
3. The Scope of Design
4. The Scope of Construction

Does this mean I **can't** take a project that is already designed off the shelf and successfully accelerate it?

Very Likely the answer is YES!

1. Scope of Project Selection

Choose Wisely and with Cause……..

Is it the whole project or just a phase?

Emergency Repair
Bridge Replacement
New or Impending Change of Use
User Impact
Funding Window

ACCELERATE AROUND THE CAUSE…..

No Cause to Accelerate = No Value to the Public

The Team..can they… ”Just Do It”

three questions….

Capability

Capacity

Relationships

1. Who Will Design It?
2. Who will Administer it?
3. Who will Likely Build it?

TEAM:

Design Engineer

Area Engineer and AEs

District Construction Engineer

Area Office Inspectors

District Lab

Potential Contractors

Potential Subs to the GC's

Suppliers in the Area

Other Stakeholders

Design for Accelerated Construction...

Get the Word Out.....Collaborate with the Team

Keep it Simple and Make it Repeatable

Open it up and Let the Contractor Work

Pay the Premium

Collaborate

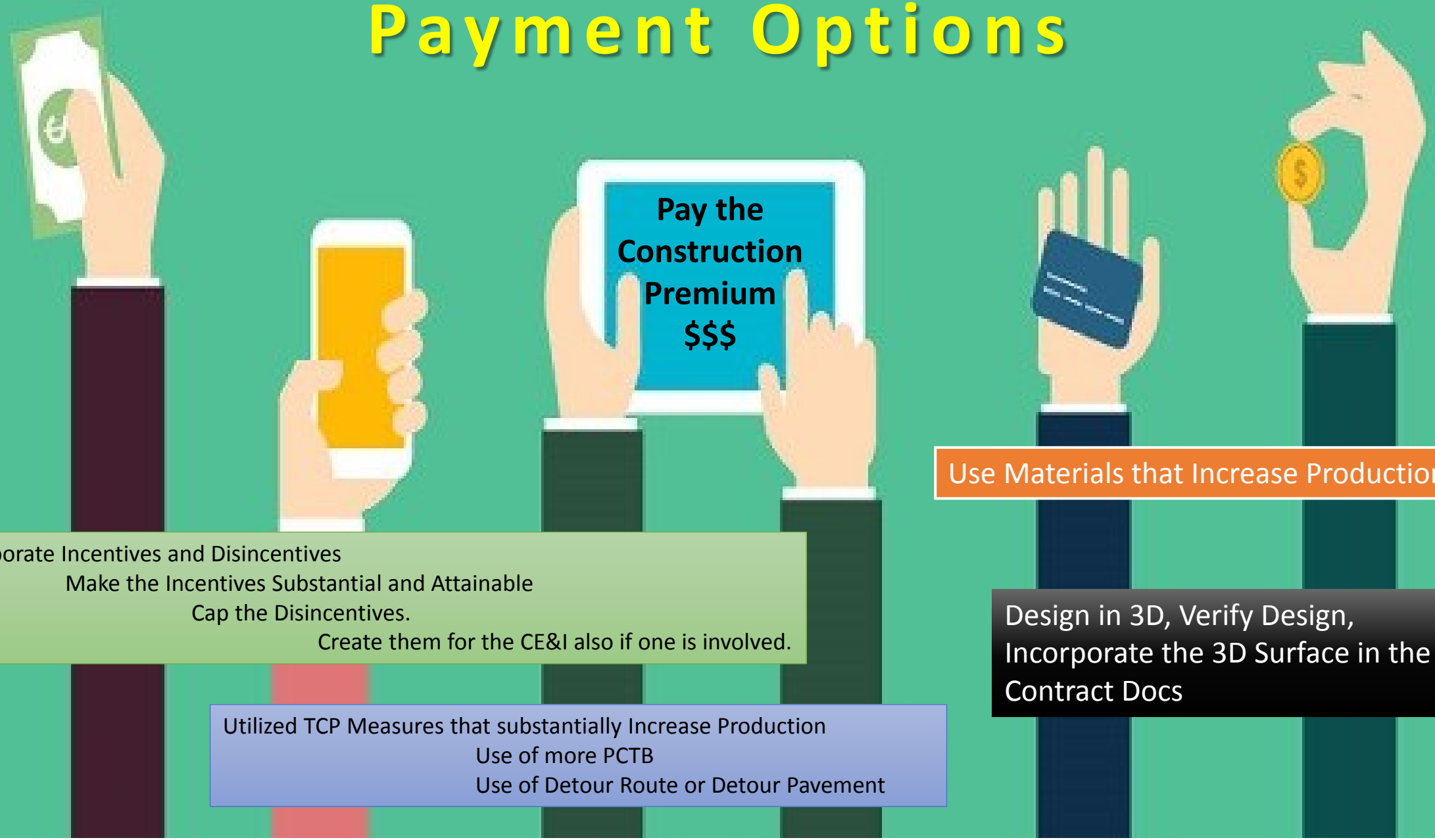
- Get the ROW and Utilities Cleared
- Get to Know the Local Resources
- Get the Plans out Early and Answer Questions

Keep it Simple….and make it repeatable…

- Design to the available materials
- ……..or allow a Procurement Period
- Be Consistent With Materials
- Maintain Roadway Geometry and Pavement Sections
- Minimize Phasing / TCP Changes
- Utilize designs that can be slip-formed or precast
- Design to the strengths of your local contractors and suppliers
- Match the Season to the Work

Open It up So the Contractor can Work…….Phase for and Allow for Concurrent Work to be part of the Sequence

Payment Options



Use Materials that Increase Production

Incorporate Incentives and Disincentives
Make the Incentives Substantial and Attainable
Cap the Disincentives.
Create them for the CE&I also if one is involved.

Design in 3D, Verify Design, Incorporate the 3D Surface in the Contract Docs

Utilized TCP Measures that substantially Increase Production
Use of more PCTB
Use of Detour Route or Detour Pavement

The Scope of Construction:

A Planned Approach w/ Preconstruction Activities

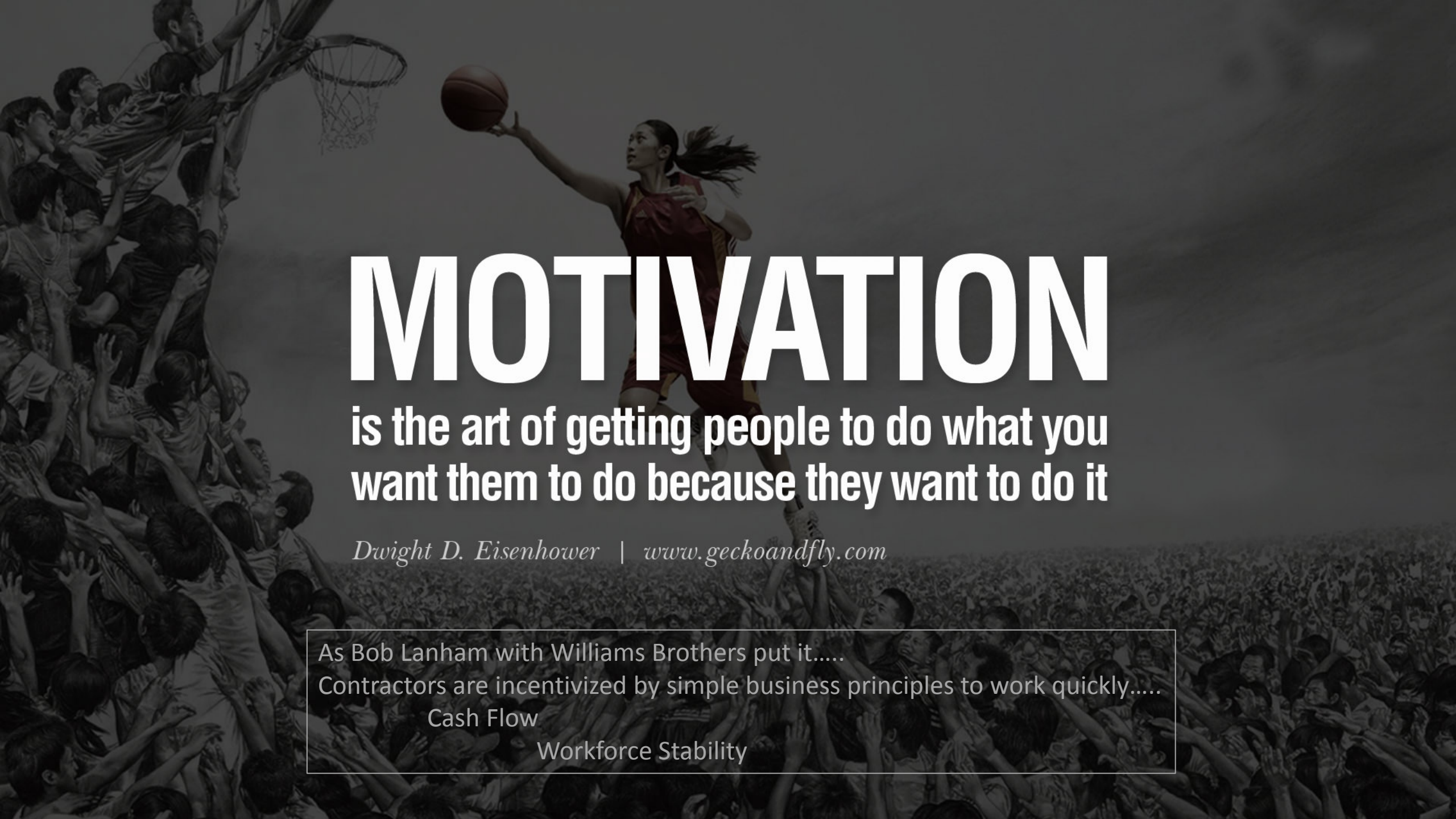
Contractor open to ask for a change and TxDOT willing to seriously consider it. (LATITUDE)

Clean Path for Value Engineering and Time Savings

Trust and Consistency with Decisions and Commitments

"Advanced Work Packaging" = "thinking with the end in mind by integrating field execution elements and considerations into the definition phase"

Seek Lowest Project Cost
NORTH
361
TEXAS
Not Lowest Construction Cost



As Bob Lanham with Williams Brothers put it…..
Contractors are incentivized by simple business principles to work quickly…..
Cash Flow
Workforce Stability

District Workshops on Accelerated Construction

Regional Workshop Exercises

AC-PP-17-11

David Newcomb

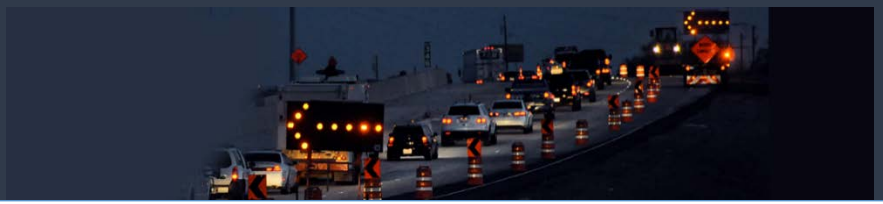
Corpus Christi
Holiday Inn
December 7, 2017

Texas Department of Transportation
Texas A&M Transportation Institute

Typical Projects

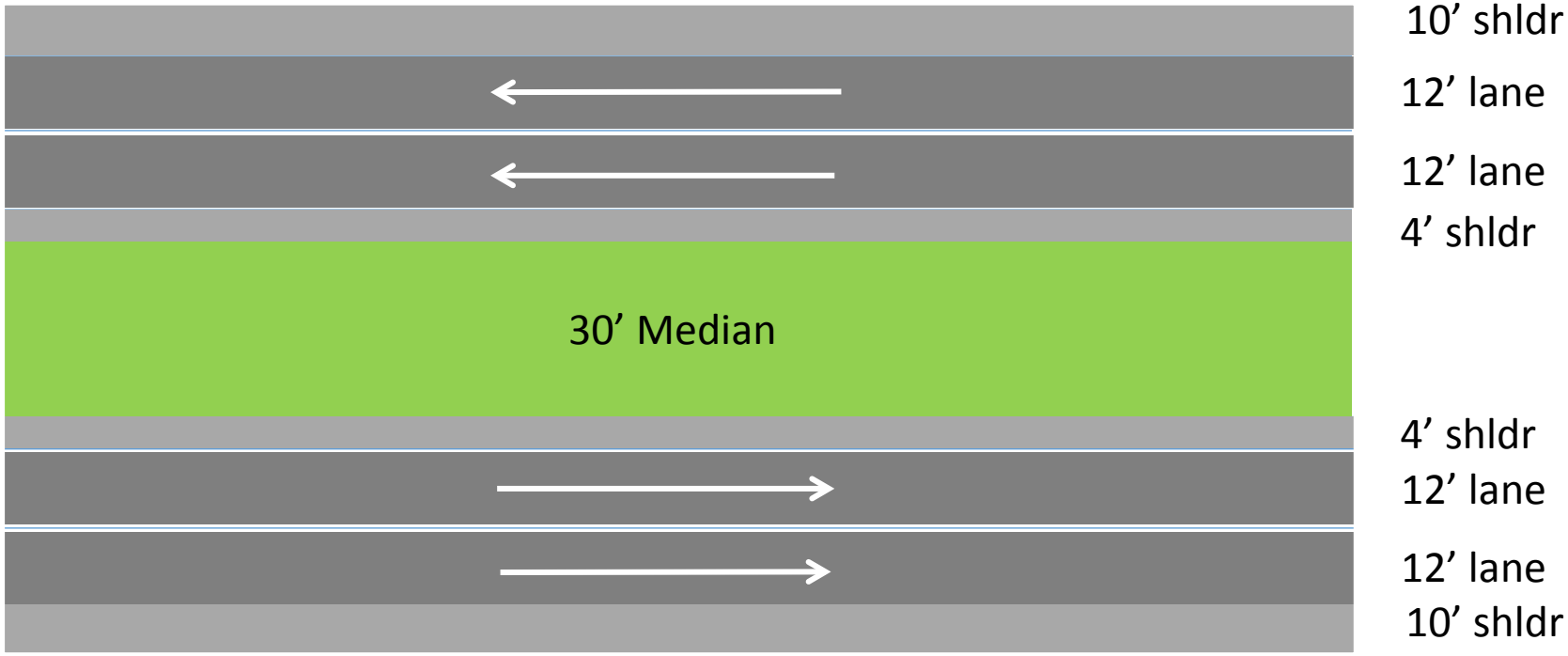
A. Pavement Strengthening
B. Pavement Widening
C. Rural Intersection Reconstruction
D. Bridge Widening
E. Small Town Main Street
F. Suburban/Rural Road Widening

Discussion Groups



Breakout Groups	*Room*	*Facilitator*	*Recorder*
A-Pavement Strengthening	Rome	Juan Bosquez-TxDOT, San Benito AE, PHR	Jesus Saavedra-TxDOT, Laredo Asst. AE, LRD
B-Pavement Widening			
C-Rural Intersection Reconstruction	Palmero	America Garza -TxDOT, CRP	David Vera-TxDOT, San Benito Area Office, Proj. Mgr., PHR
D-Widening Bridge	Pompeii	Juan Sustaita-TxDOT, Pharr AE, PHR	Robert Trevino Flores-TxDOT, District Construction Engineer, CRP
E-Small Town Intersection	Front Right	Oscar Soliz-TxDOT, Alice AE, CRP	Cario Rogerio-TxDOT, District Construction Engineer, LRD
F-Suburban/Rural Widening	Back Left	Nick Novasad-TxDOT, Karnes City AO, CRP	Andres Espinoza-TxDOT, San Benito Asst. AE, PHR

Exercise A: Pavement Strengthening



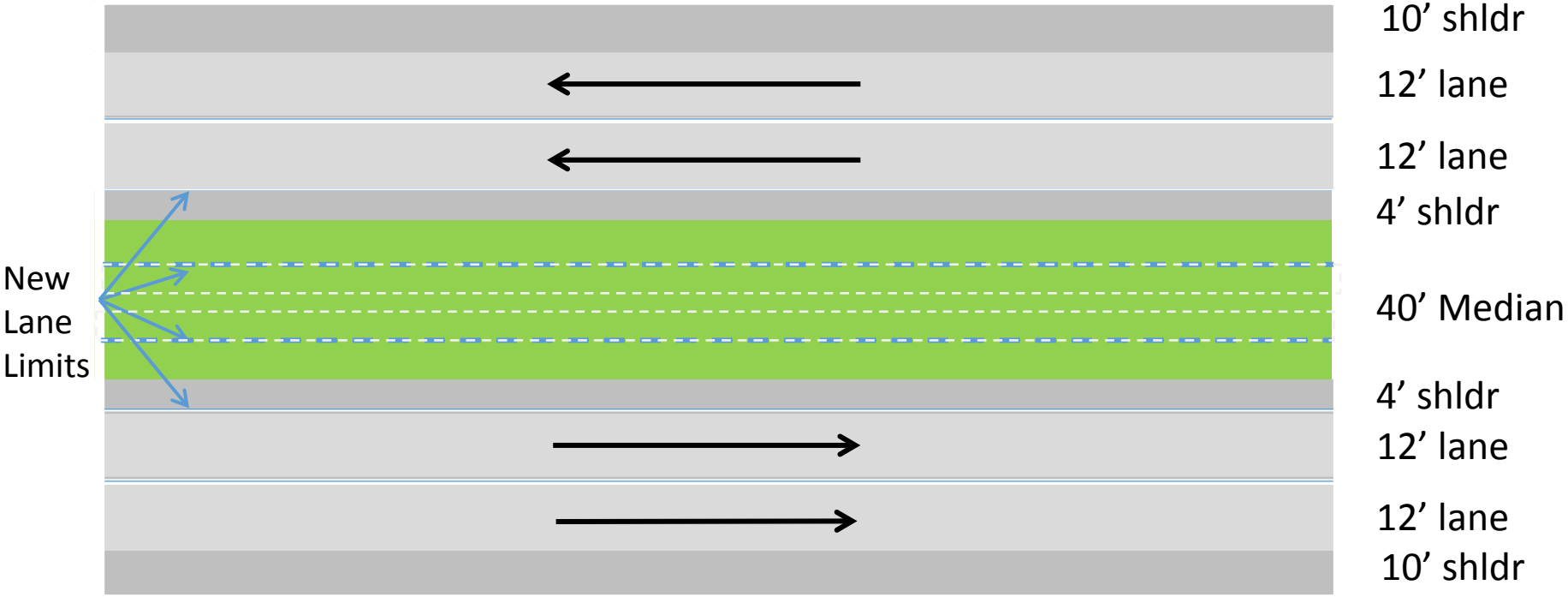
Project Details:

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

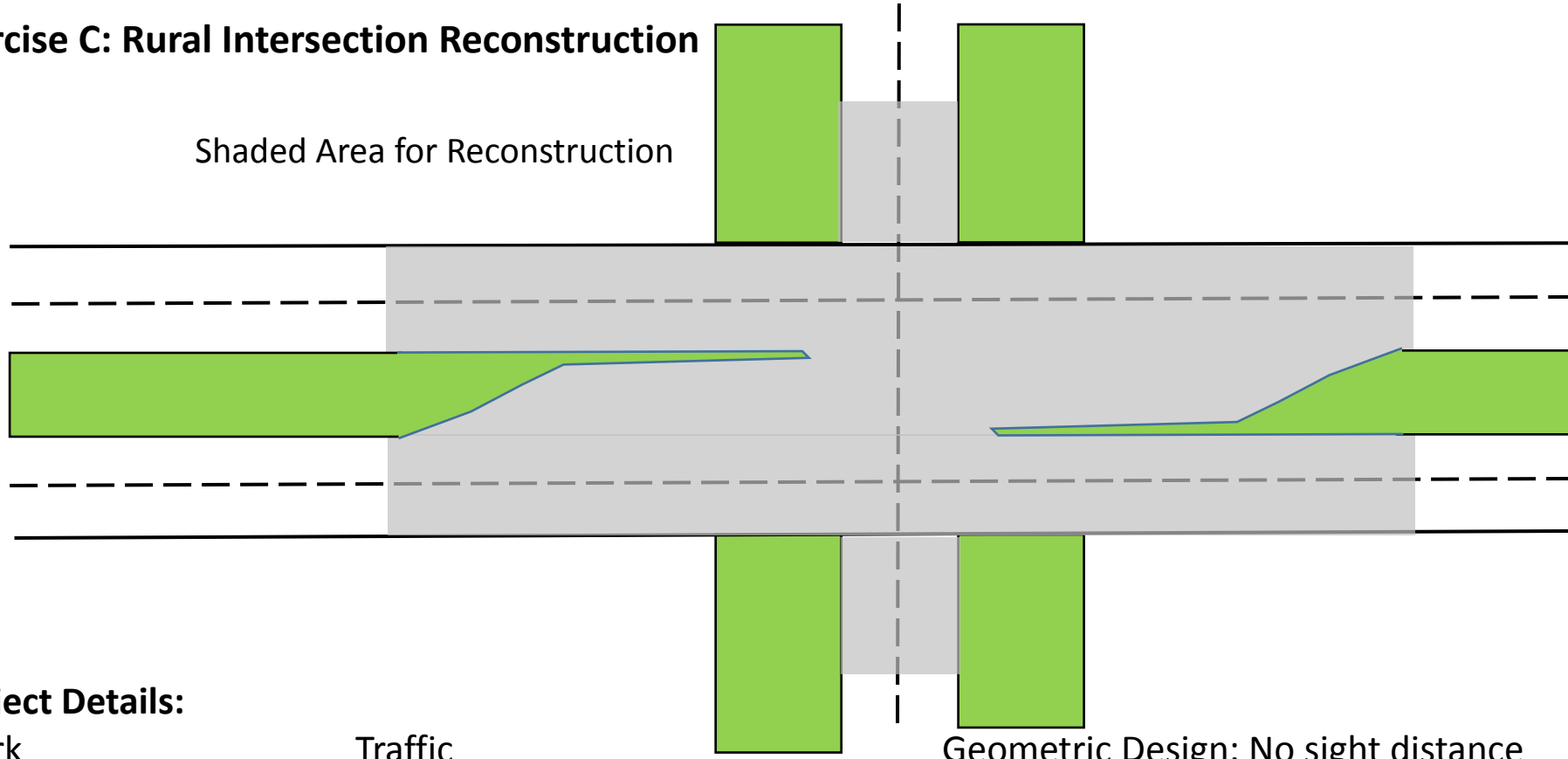
Geometric Design: High speed freeway design

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



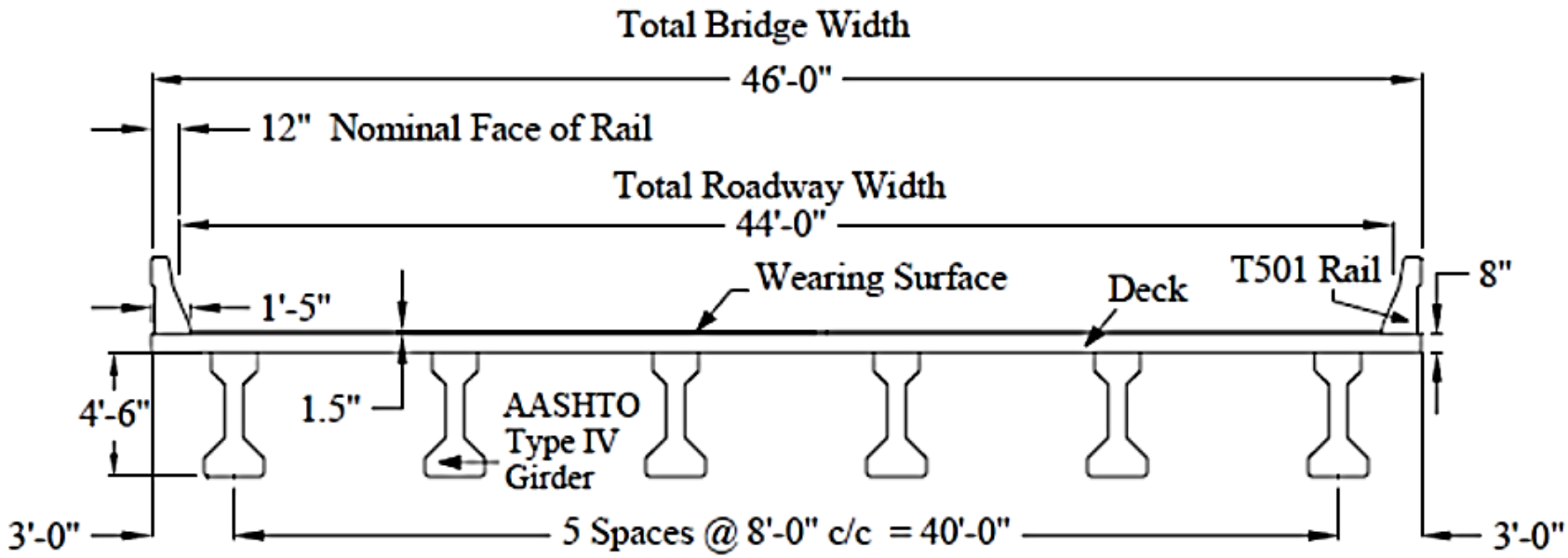
Project Details:

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



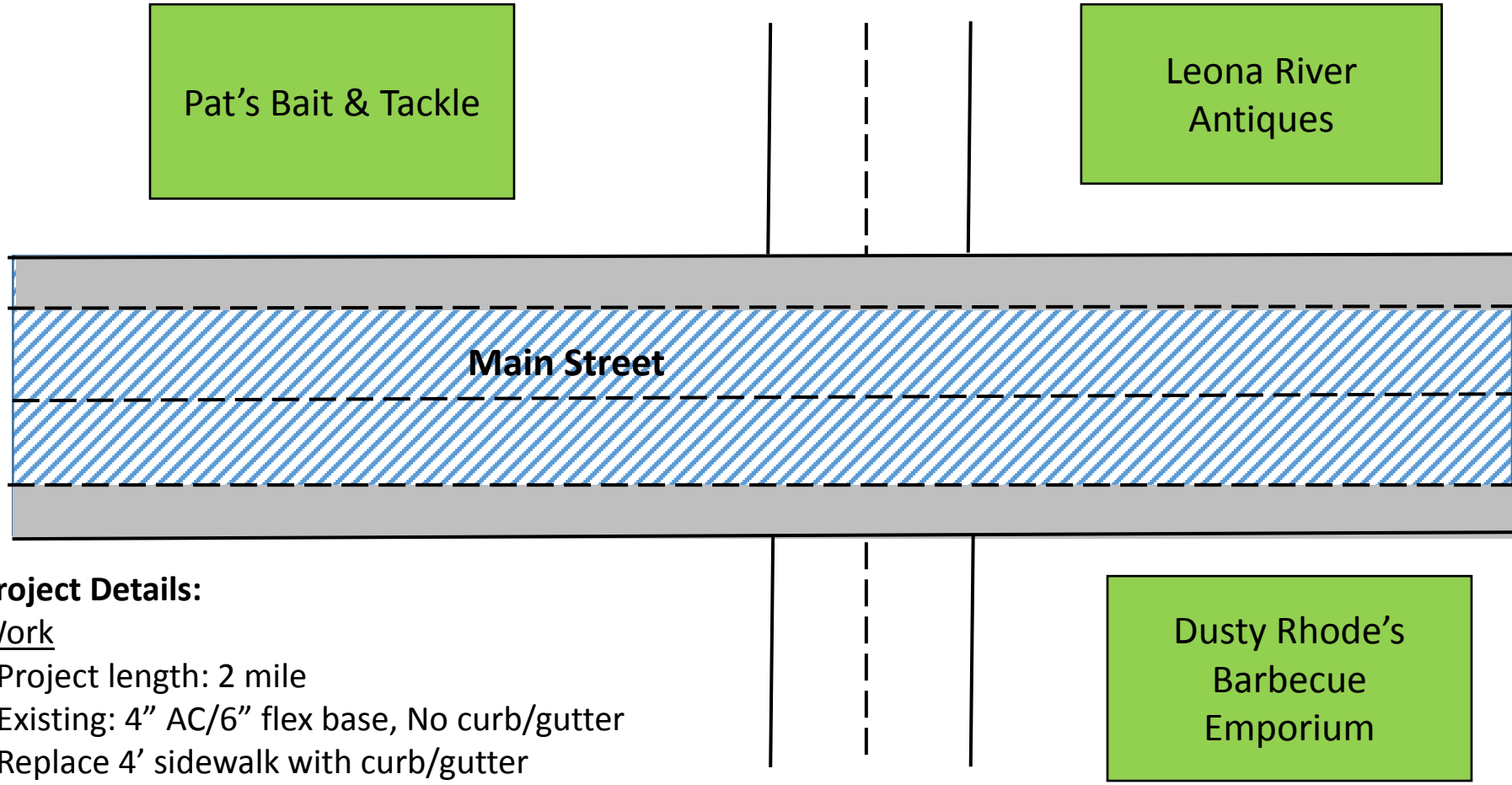
Project Details

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.)

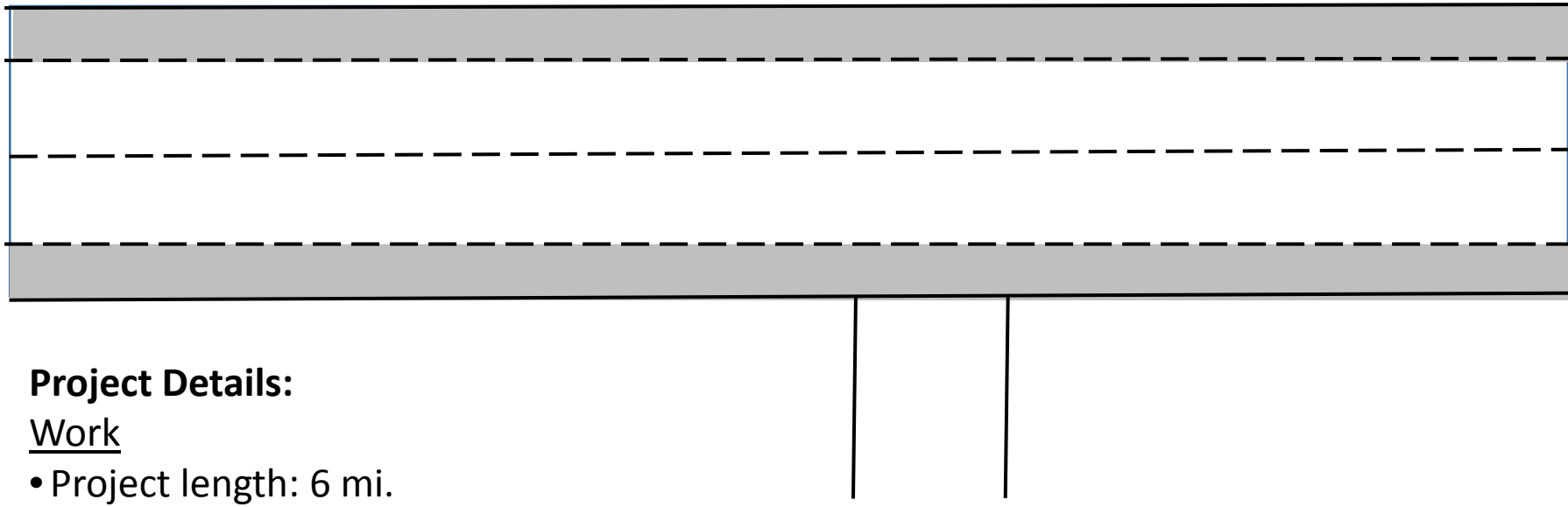
Geometric Design: Tangent section, 10 cross roads

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.

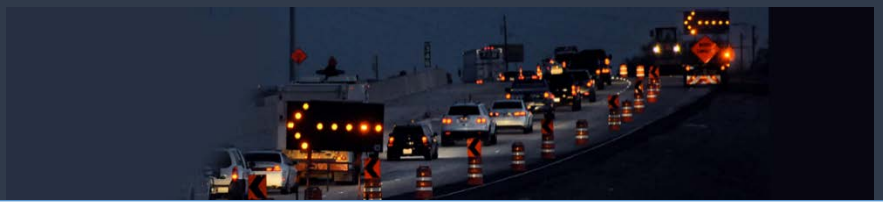
Geometric Design: Adequate design, no major changes in horizontal & vertical alignment

Drainage: 1 box culvert & 5 pipe culverts need widening

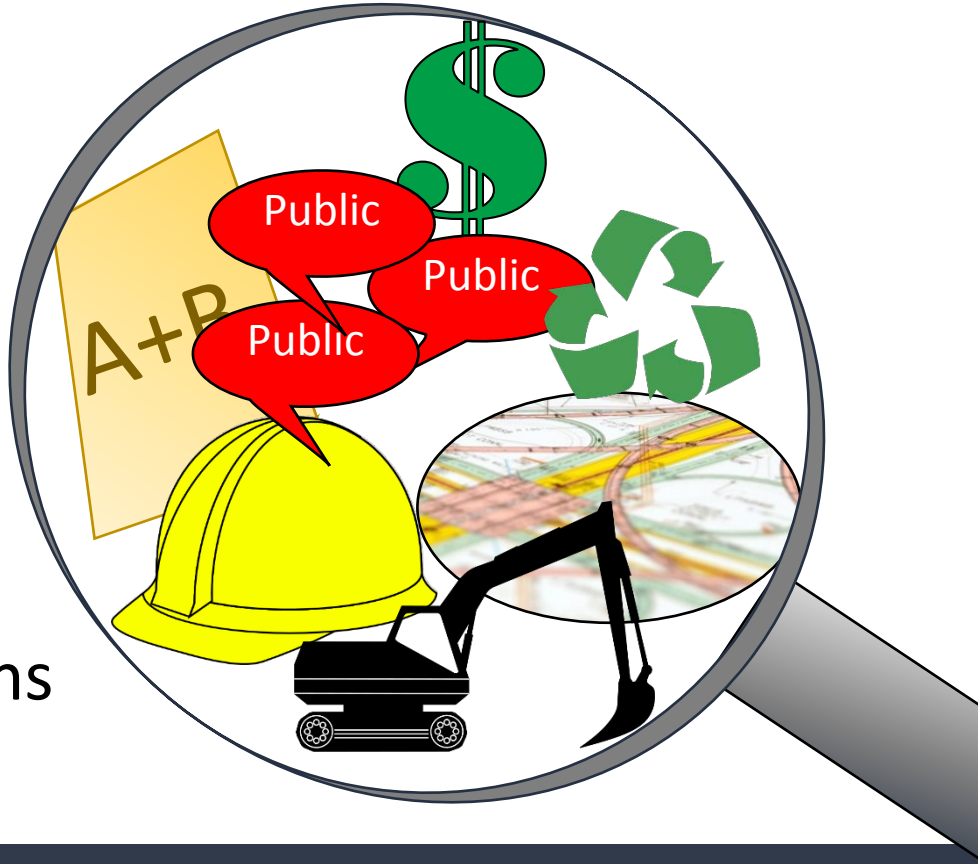
Economics: Approx. $ 1M in user cost savings possible with aggressive accelerated construction schedule

Utilities: Not an issue

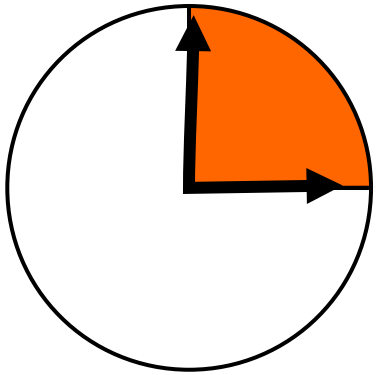
Items to Consider



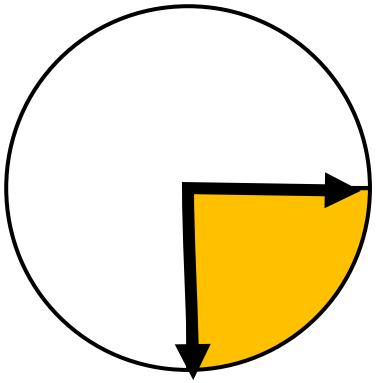
- Key economic analysis factors
- ROW, utilities, environmental, historic preservation, archeology
- Public information
- Contracting methods
- Design
- Contractor selection
- Involvement of contractor
- Construction considerations
- Other



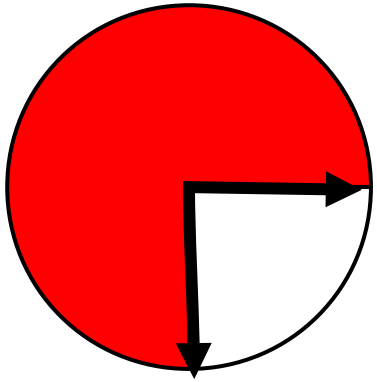
Suggested Time Utilization



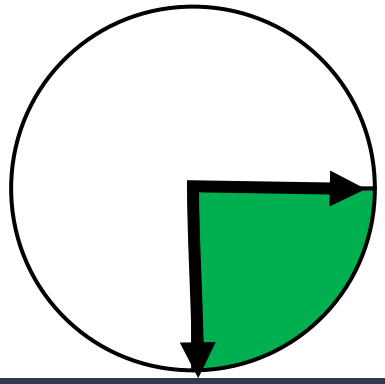
- General project discussion – 15 min



- Items to consider – 15 min

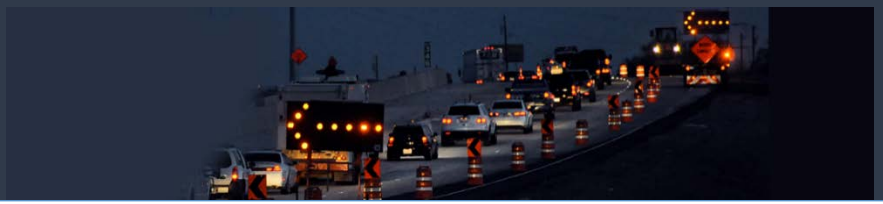


- Top five challenges – 45 min

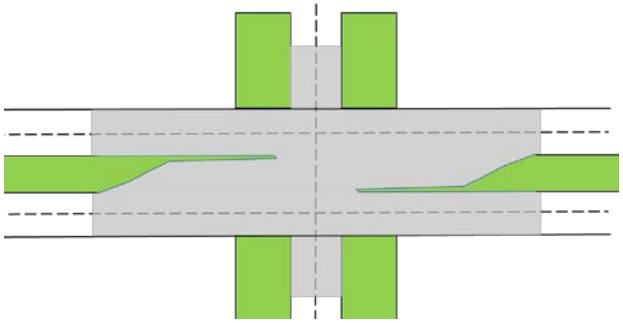


- Information needs – 15 min

Facilitator Report



- Briefly describe project
- Top 5 challenges
- Information needs



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

District Workshops on
Accelerated Construction

Corpus Christi
Holiday Inn
December 7, 2017

Texas Department of Transportation

Texas A&M Transportation Institute

District Workshops on Accelerated Construction

Workshop Summary

AC-PP-17-14

Jon Epps

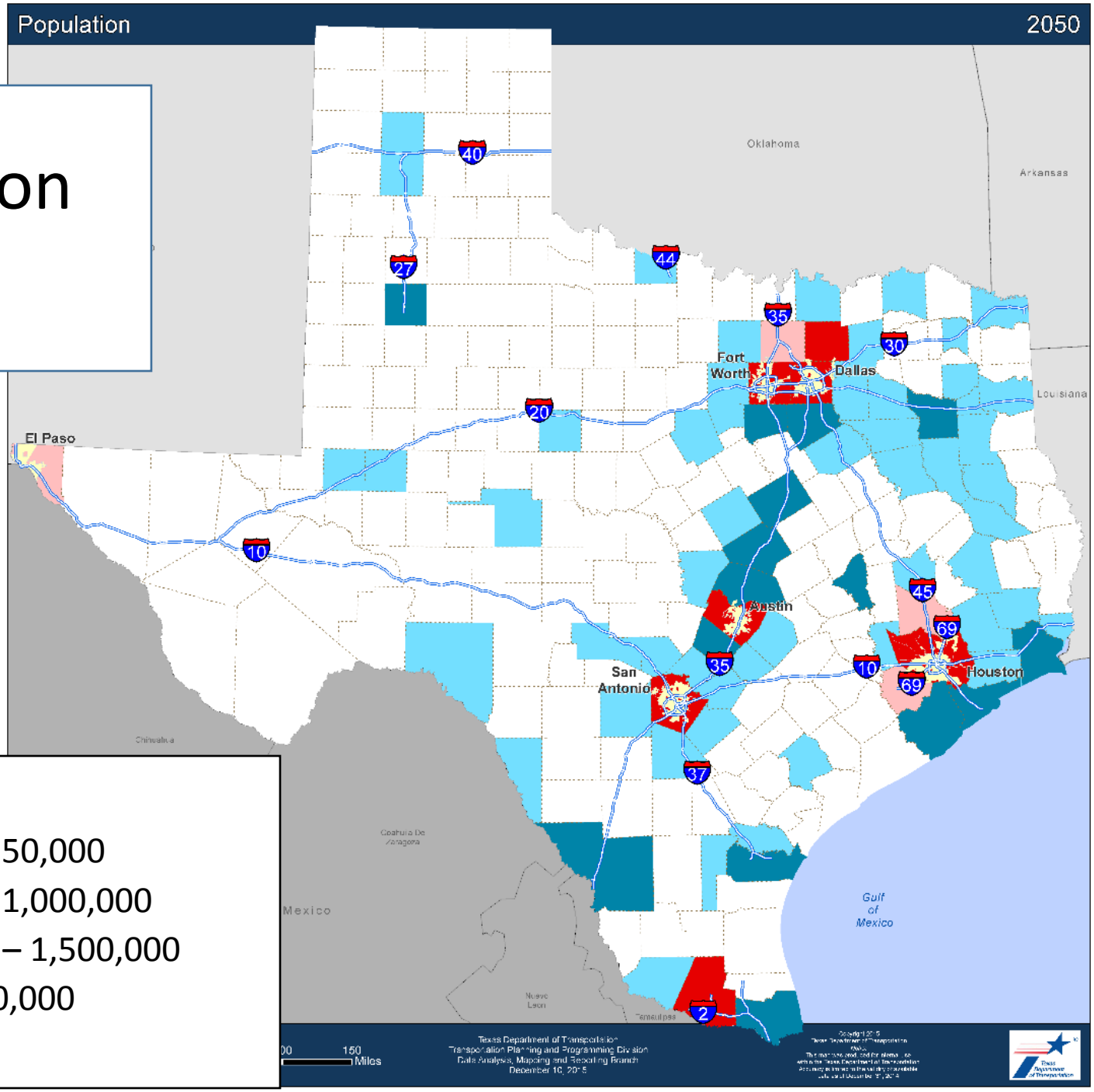
Corpus Christi
Holiday Inn
December 7, 2017

Texas Department of Transportation

Texas A&M Transportation Institute

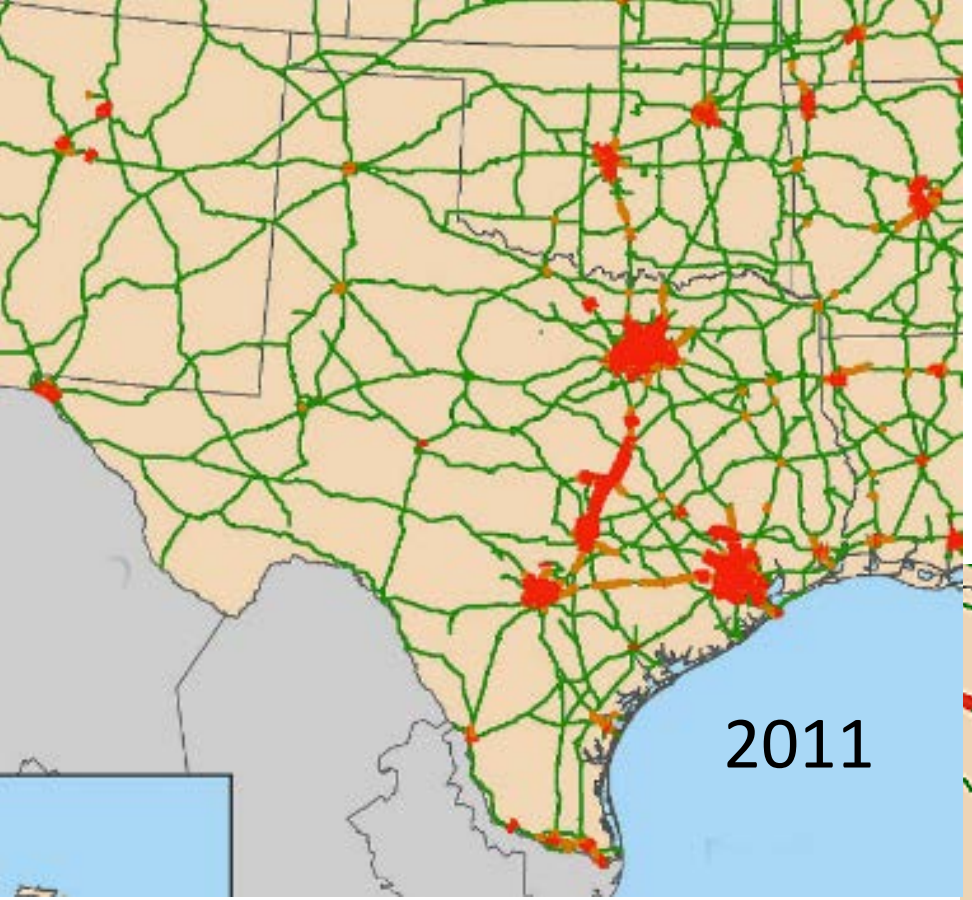
www.txdot.gov/business/resources/construction/regional-workshops.html

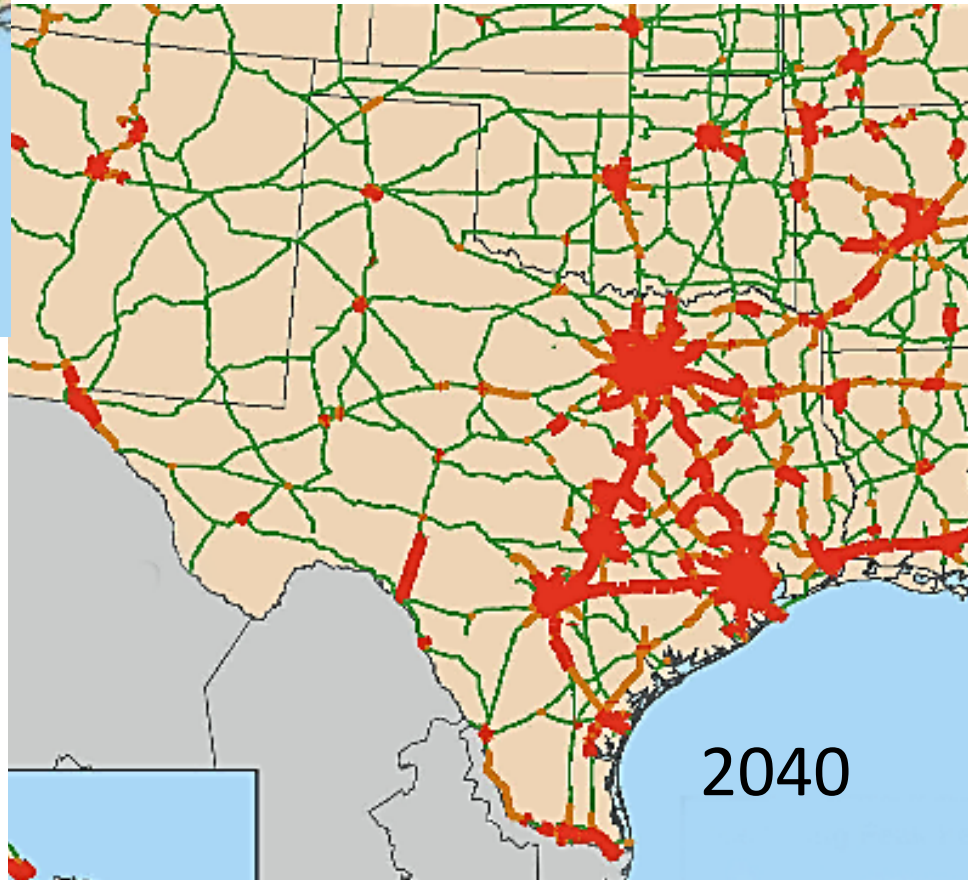
Population 2050



- 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

Unified Transportation Plan

Texas Department of Transportation

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

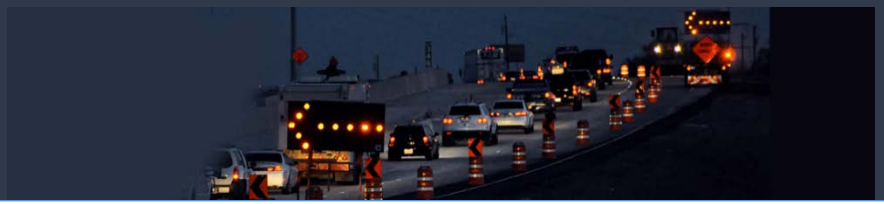
Working together to successfully deliver projects.

We Build Texas

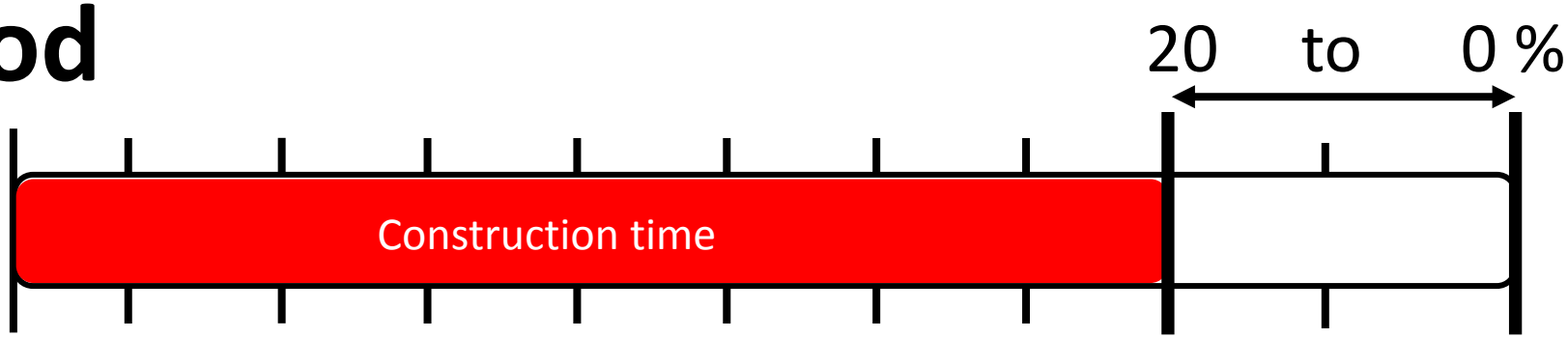
Interest in Accelerated Construction

- Visibility to public
- Safety
- Economics

Acceleration Goals

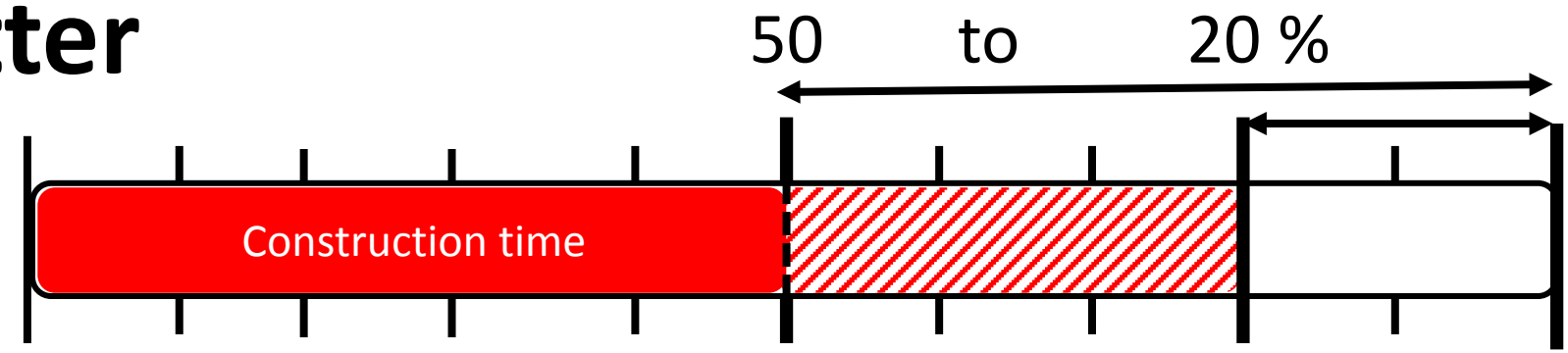


Good



reduction in time to complete project

Better

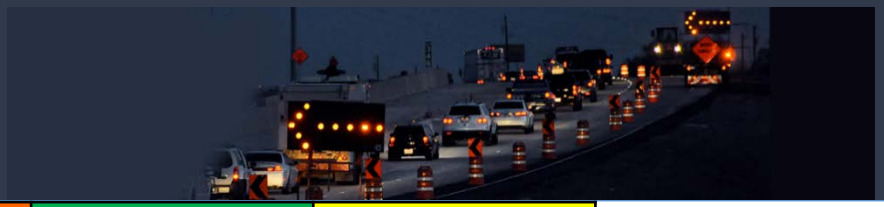


Economic Consideration

- 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



Planning & Programming	Preliminary Design	Environmental	ROW Utilities	PS&E

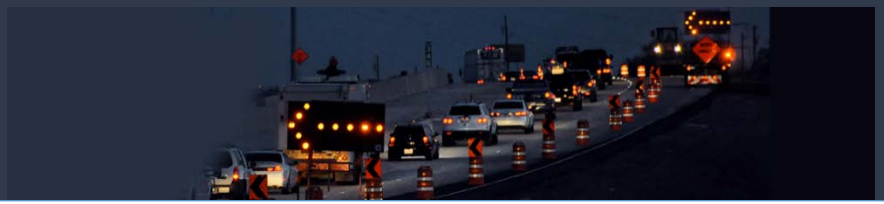
• Need
• Scope
• Cost estimate
• Authorization
• Planning
• Funding
	Design Concept
	• Data Collection
	• Public meetings
	• Schematics
	  • Preliminary
	  • Geometric
	• Value Engineering
		• Preliminary
		• Interagency
		• Documentation
		• Public hearing
		• Clearances
			• Data Collection
			• ROW map
			• Appraisals
			• Acquisition
			• Utility adjustment
				• Design details
				• Final alignment & profiles
				• Roadway
				• Operational
				• Bridge
				• Drainage
				• Misc structures
				• Traffic control
				• Review

Letting

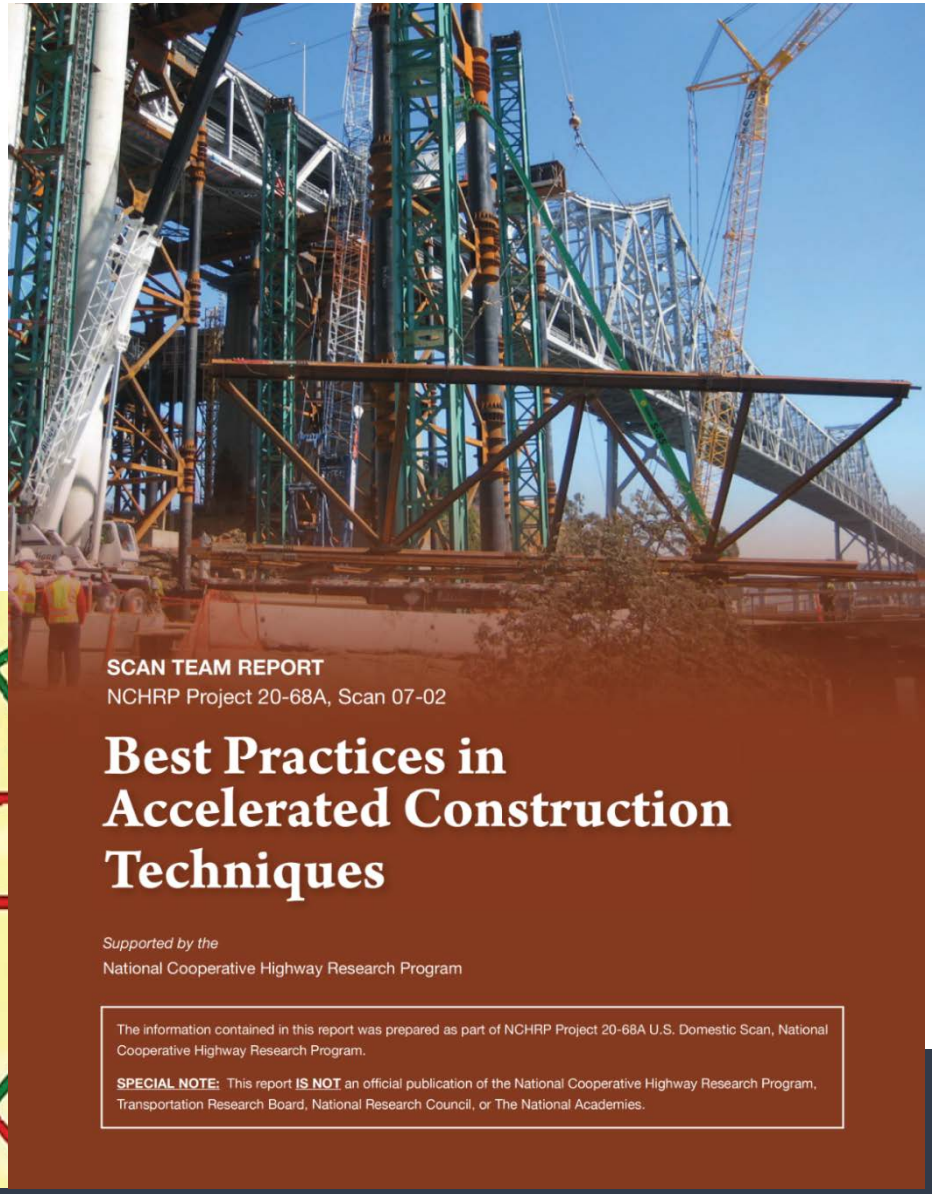
Construction

Time

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.

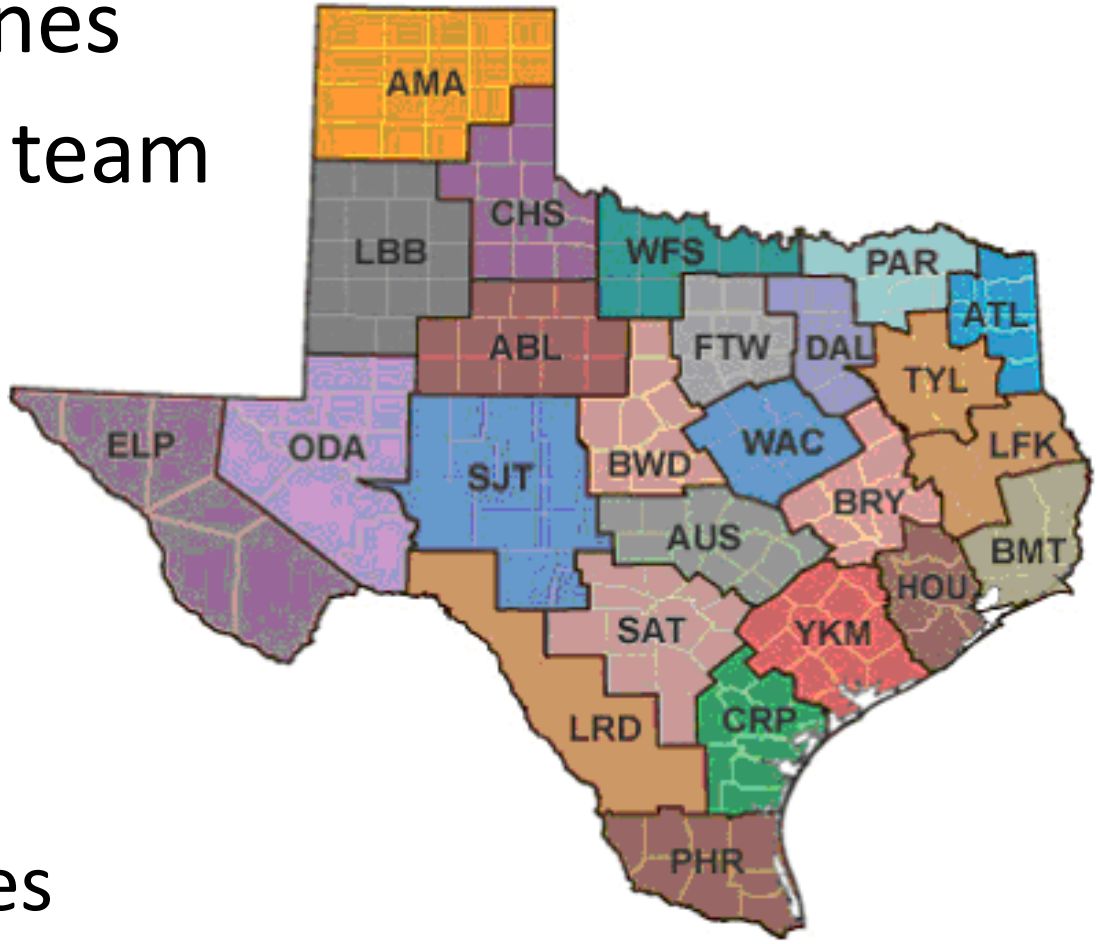
SPECIAL NOTE: This report **IS NOT** an official publication of the National Cooperative Highway Research Program, Transportation Research Board, National Research Council, or The National Academies.

Economic Incentives - Contractor

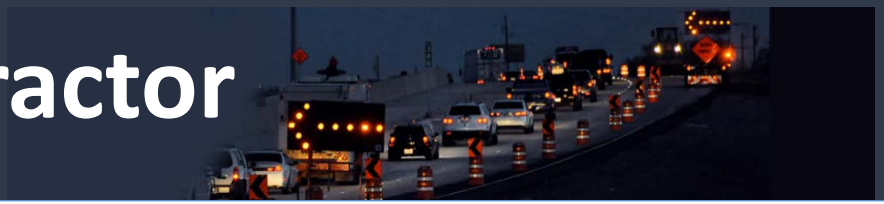
- One job/occasional job
- Return on investment (equipment)
- Bonding capacity
- Backlog of work
- Risk

Policies and Procedures

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



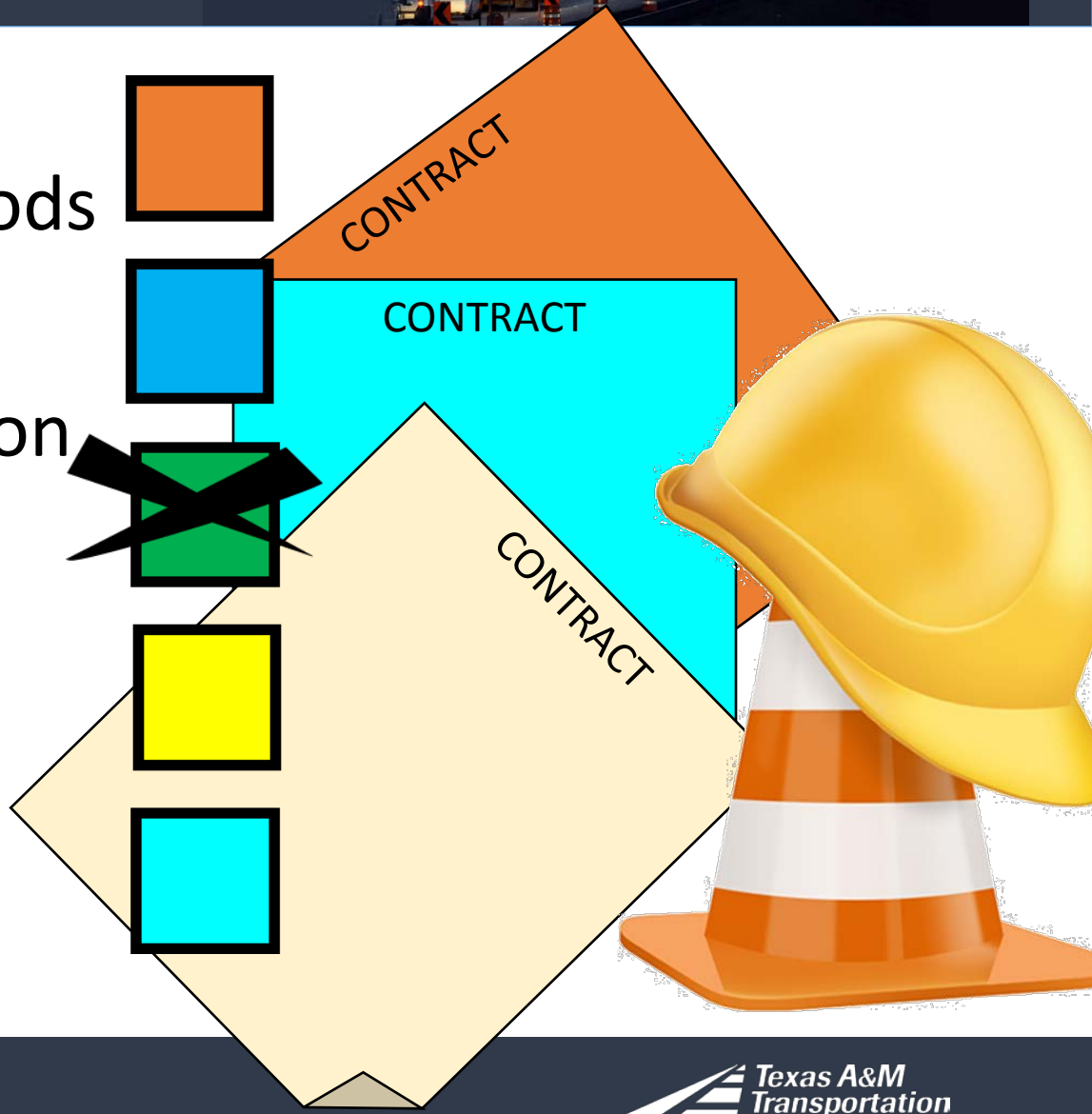
Involvement of Contractor



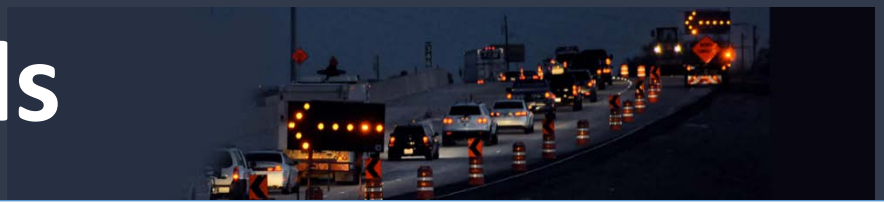
- Planning and design review
- Partnering
- Communication
- Workforce

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

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Stay IN
Get OUT
Stay OUT

District Workshops on **Accelerated Construction**

District Workshops on
Accelerated Construction

District Workshops on
Accelerated Construction

Texas Department of Transportation

Texas A&M Transportation Institute

Corpus Christi
Holiday Inn
December 7, 2017

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