

Amarillo/Childress/El Paso/Lubbock: District Workshop on Accelerated Construction
November 8, 2017
MCM Elegante Hotel and Suites Lubbock

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 Chris Reed - TxDOT, CHS
11:00-11:20	Design Considerations	Ed Goebel - TxDOT, LBB
11:20-11:30	Traffic/Safety	Frank Guzman - TxDOT, ELP
11:30-11:40	Public Information	Sonja Gross - TxDOT, CMD (AMA)
11:40-12:00	Construction	Michael Oliver - Webber LLC
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-Aldo Madrid - TxDOT, ELP B-Breakout Omitted C-Daniel Cruz - TxDOT, LBB D-Wes Kimmell - TxDOT, AMA E-Corky Neukam - TxDOT, AMA F-Chuck Steed - TxDOT, CHS <i>Recorders:</i> A-Matt Herbstritt - TxDOT, CHS B-Breakout Omitted C-Francisco Marez - TxDOT, ELP D-Jorge Oregel - TxDOT, ELP E-Dominique Lorng - TxDOT, LBB F-Falon Renfro - TxDOT, AMA Eric Rodriguez - TxDOT, LBB
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	Michael Oliver - Webber LLC
3:45-4:15	TxDOT's View of the Future	Randy Hopmann - TxDOT, ADM
4:15-4:30	Summary/Adjourn	Jon Epps - TTI

DISTRICT'S WORKSHOP ON ACCELERATED CONSTRUCTION

Lubbock
MCM Elegante Hotel and Suites
November 8, 2017

Time	Topic	Speaker/Facilitator
8:00-8:30	Registration	
8:30-8:45	Welcome	Jon Epps - TTI
8:45-9:00	History of Accelerated Construction in U.S.	David Newcomb - TTI, Division Head, Materials and Pavements
9:00-9:30	TxDOT's Interest	Randy Hopmann - TxDOT, Director of District Operations, Administration
9:30-9:50	Project Selection Based on Economics	Briane Glover – TTI, Division Head, Infrastructure Investment Analysis
9:50-10:10		Break
10:10-10:40	Project Development	Michael Bostic, Construction Division, CST
10:40-11:00	Accelerated Bridge Construction in Texas	Steven Austin – TxDOT, Bridge Division, Chris Reed – TxDOT, Director of Construction, LBB
11:00-11:20	Design Considerations with Examples of Past Success	Ed Goebel-TxDOT, Director of Construction, LBB
11:20-11:30	Traffic and Safety	Frank Guzman-TxDOT, West El Paso AE, ELP
11:30-11:40	Public Information	Sonja Gross-TxDOT, Public Information Officer, AMA
11:40-12:00	Accelerated Construction Concepts	Michael Oliver, Webber LLC.
12:00-12:45		Lunch



Time	Topic		Speaker/Facilitator
12:45-1:00	Charge to Breakout Groups		David Newcomb - TTI, Division Head, Materials and Pavements
1:00-2:30	Topic	Facilitators	<i>Recorders</i>
	• A-Pavement Strengthening	Aldo Madrid-TxDOT, District Laboratory, ELP	Matt Herbstritt – TxDOT, Childress Asst. AE, CHS
	• B-Pavement Widening		
	• C-Rural Intersection Reconstruction	Daniel Cruz-TxDOT, Laboratory Supervisor, LBB	Francisco Marez-TxDOT, East El Paso Asst., ELP
	• D-Widening Bridge	Wes Kimmell-TxDOT, Pampa AE, AMA	Jorge Oregel-TxDOT, West El Paso Asst. AE, ELP
	• E-Small Town Intersection	Corky Neukam-TxDOT, Dumas AE, AMA	Dominique Lornng-TxDOT, Design Tech III, LBB
	• F-Suburban/Rural Widening	Chuck Steed-TxDOT, Director of TP&D, CHS	Falon Renfroe-TxDOT, Engineering Asst. III, AMA or Eric Rodriquez-TxDOT, Design Tech III
2:30-3:15	Report from Breakout Groups & Discussion		David Newcomb - TTI, Division Head, Materials and Pavements
3:15-3:30	Break		
3:30-3:45	Looking to the Future-Contractor		Michael Oliver, Webber LLC.
3:45-4:15	Looking to the Future-TxDOT		Randy Hopmann - TxDOT, Director of District Operations, Administration
4:15-4:30	Summary and Adjourn		Jon Epps - TTI

District Workshops on Accelerated Construction

Welcome
AC-PP-17-01
Jon Epps

Lubbock

MCM Elegante Hotel and Suites

November 8, 2017

www.txdot.gov/business/resources/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>

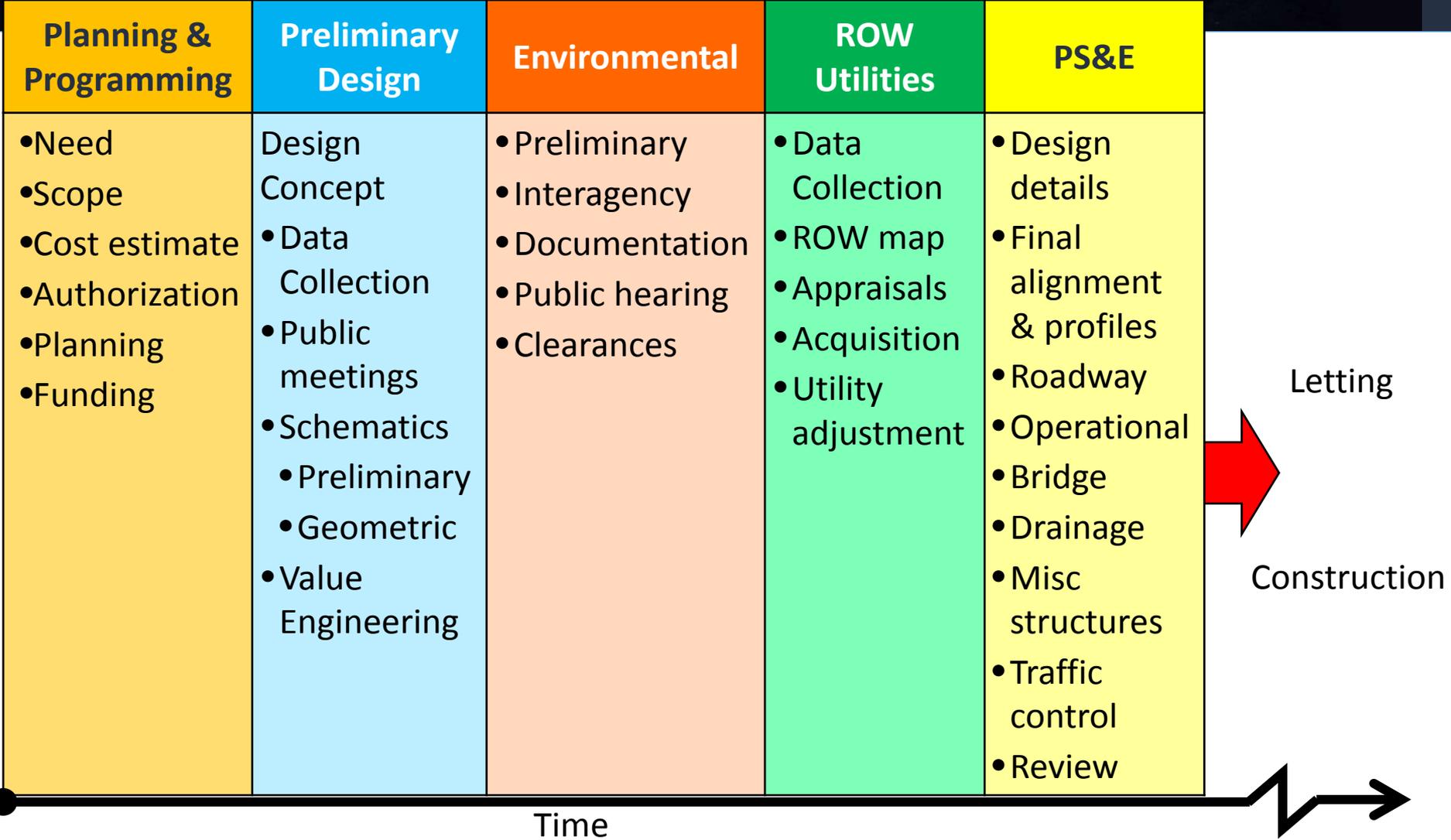
Definition of Construction

Greenfield

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



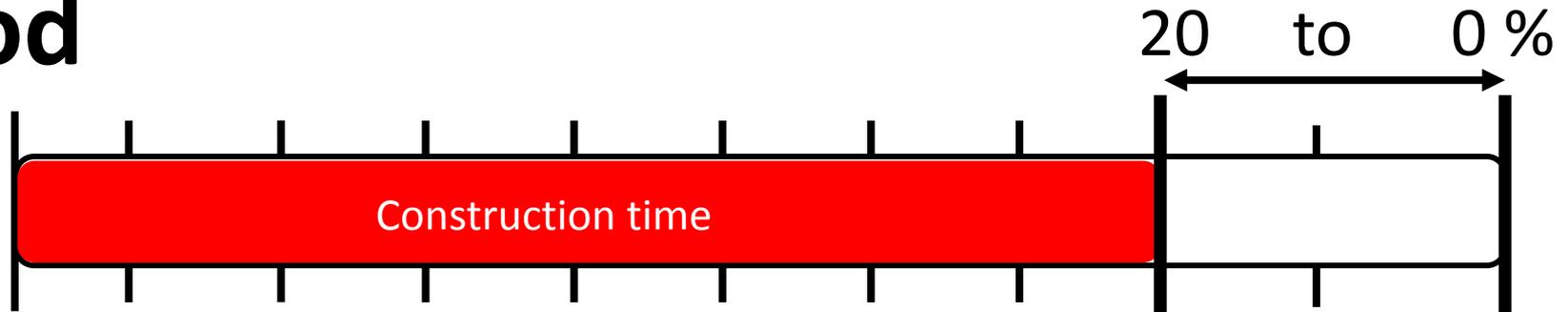
Project Delivery



Acceleration Goals

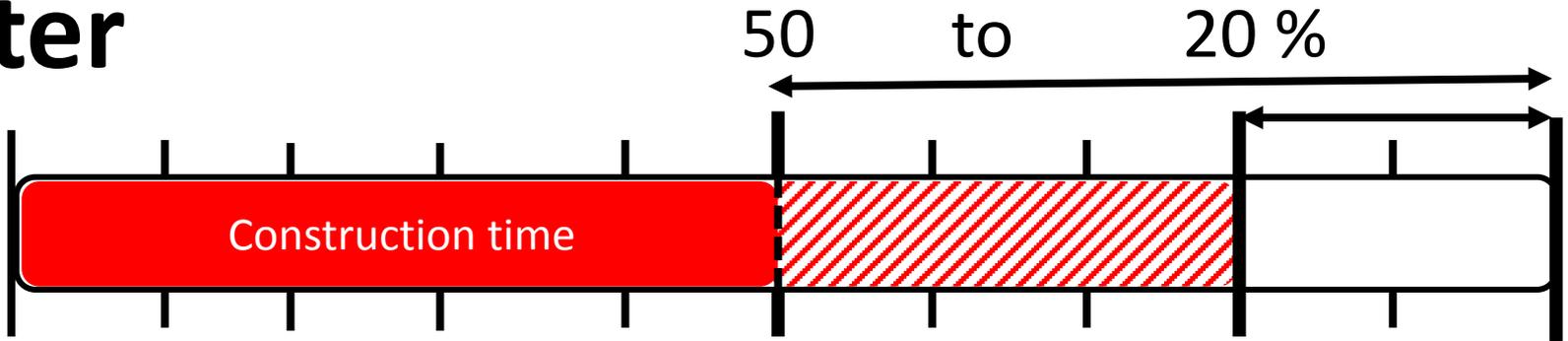


Good



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
8:45-9:00	History of Accelerated Construction	Newcomb
9:00-9:30	TxDOT's Interest	Hopmann
9:30-9:50	Project Selection Economics	Ellis/Glover
9:50-10:10	BREAK	TBD
10:10-10:40	Project Development	
10:40-11:00	Accelerated Bridge Construction	Austin, Reed
11:00-11:20	Design Considerations	Goebel
11:20-11:30	Traffic/Safety	Guzman
11:30-11:40	Public Information	Gross
11:40-12:00	Construction	Oliver
12:00-12:45	LUNCH	

Agenda



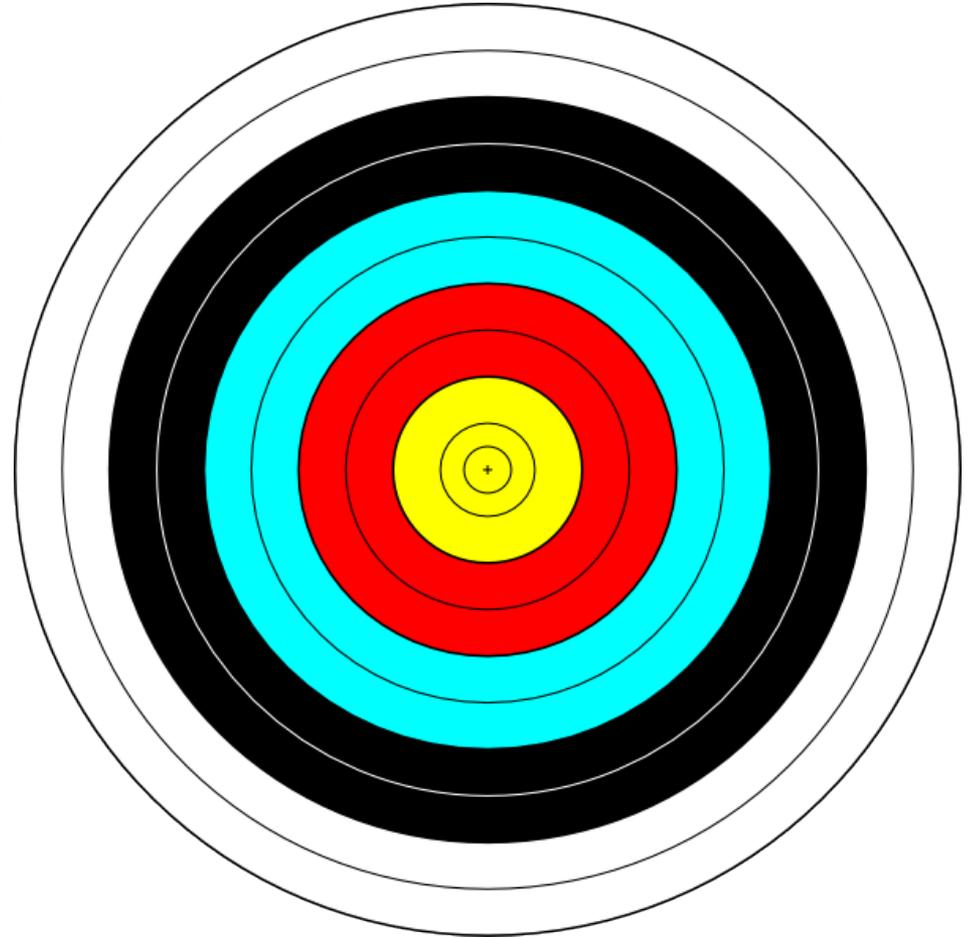
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12:45-1:00	Charge to Groups	Newcomb
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3:15-3:30	BREAK	
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4:15-4:30	Summary/Adjourn	Epps



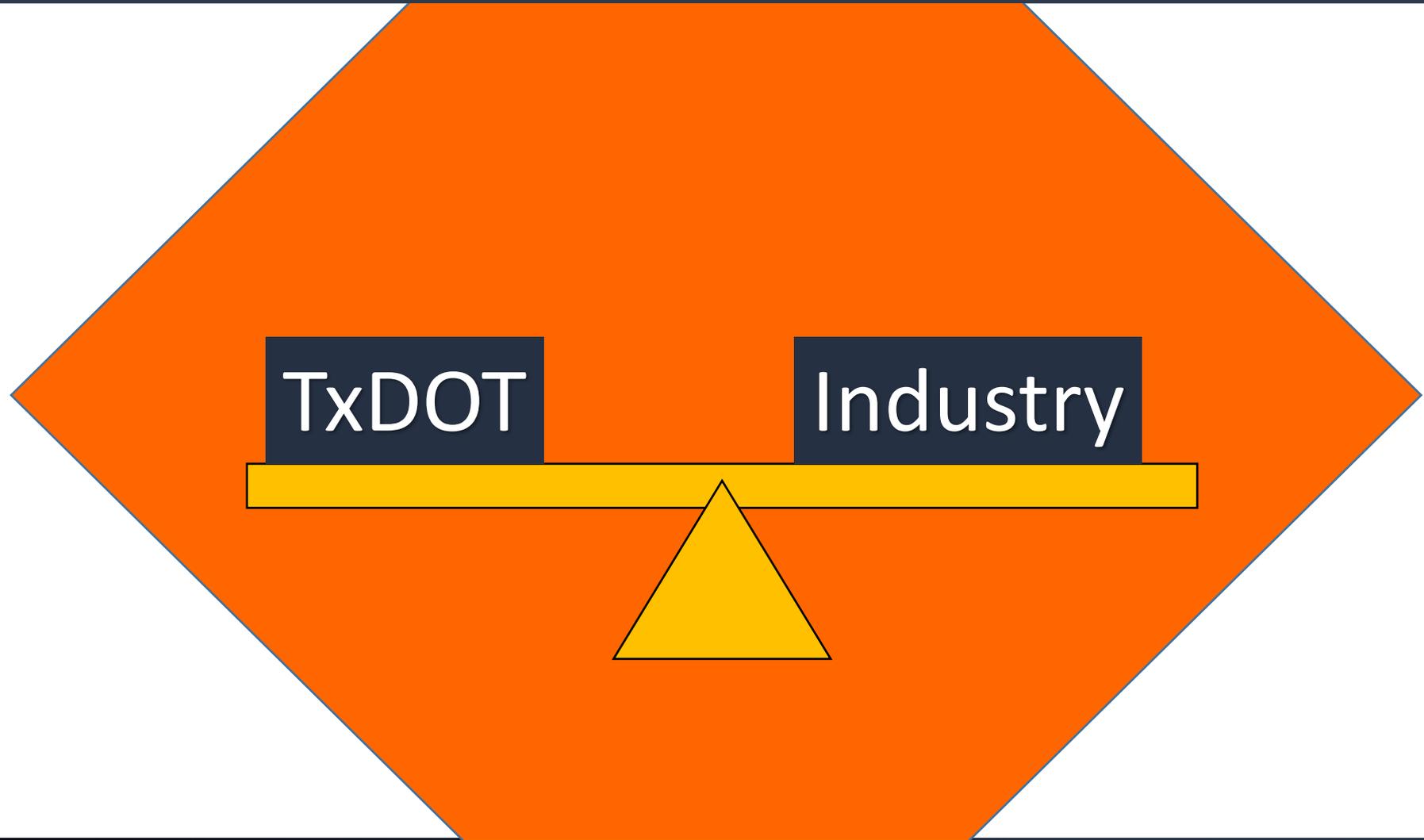
Workshop Goals



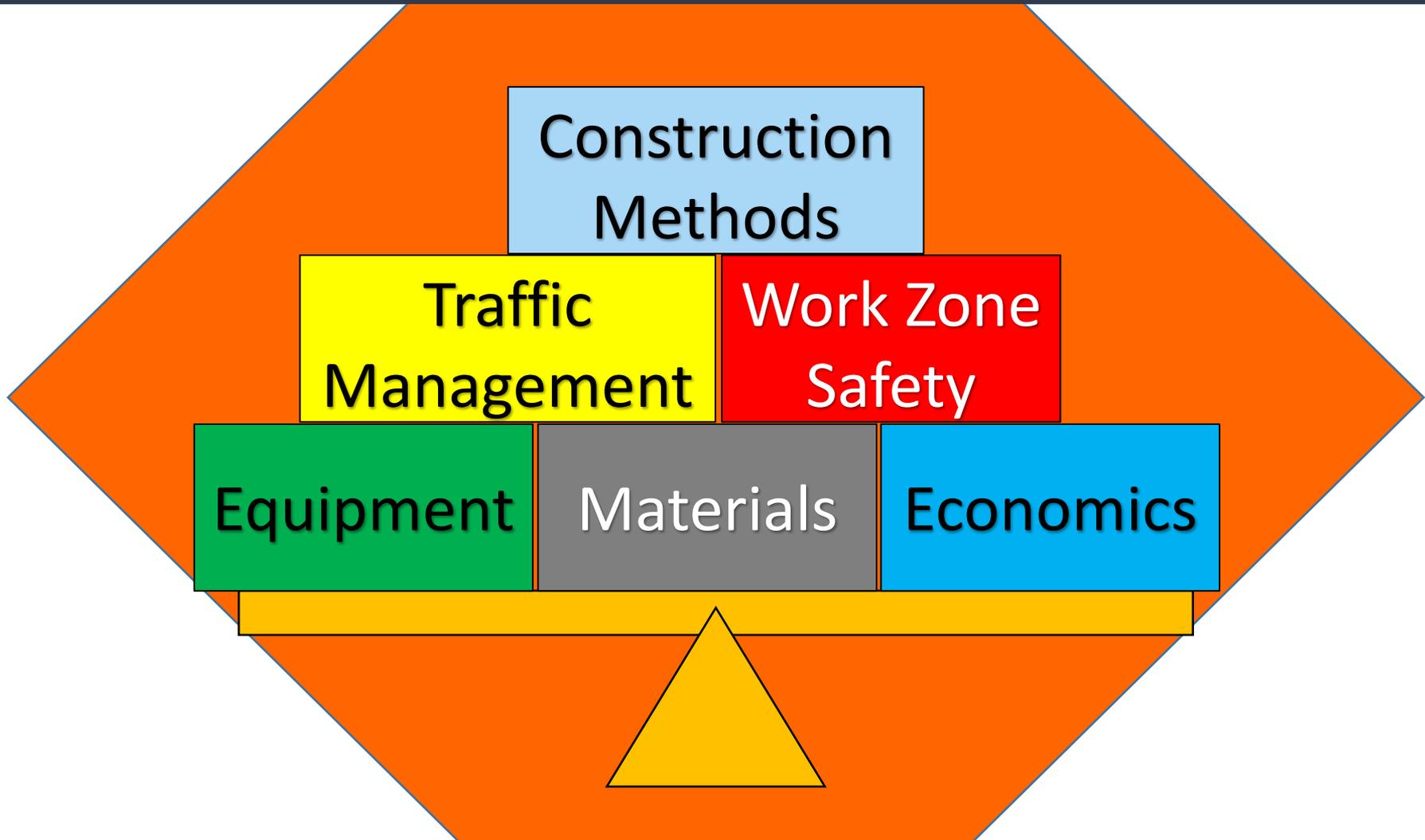
- Information sharing
- Existing TxDOT “tools”
- Identify needed “tools” & “policies”



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

Lubbock

MCM Elegante Hotel and Suites

November 8, 2017





Accelerated Construction

U.S. History



History



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



1990's – 2000's Driving Forces

Increasing Demand (1980-2000)

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

Aging System

40 % Bridges +40 Years Old
Pavements Exceeded
Design Life



+80%



+31%



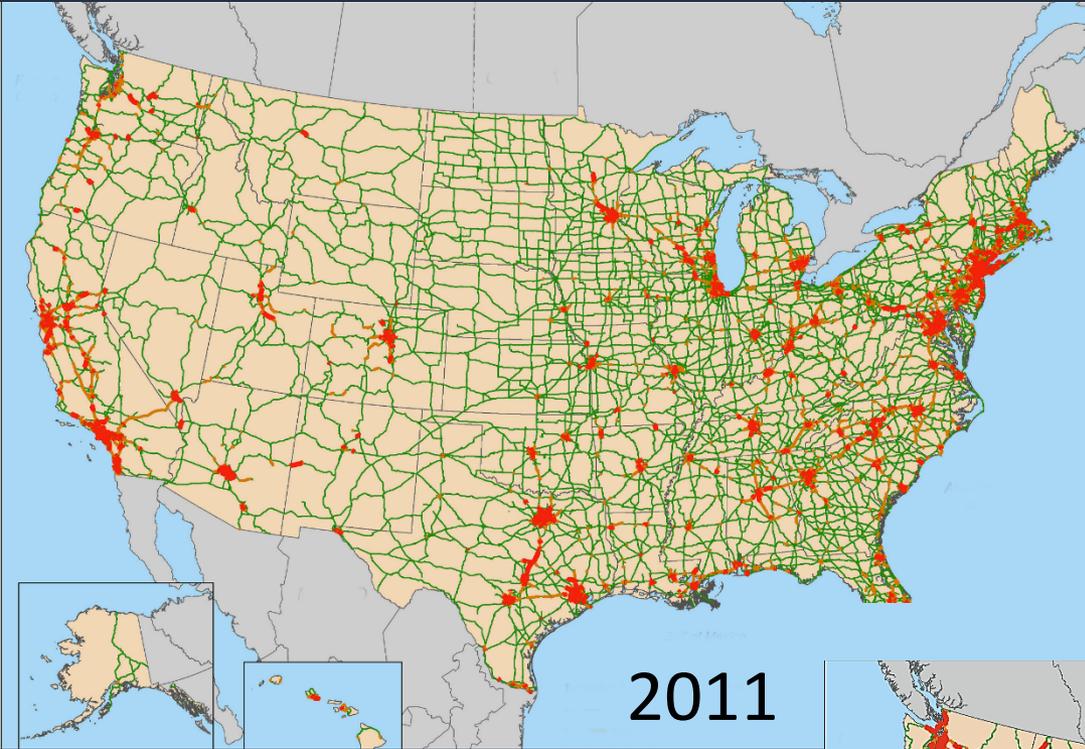
+3.8%



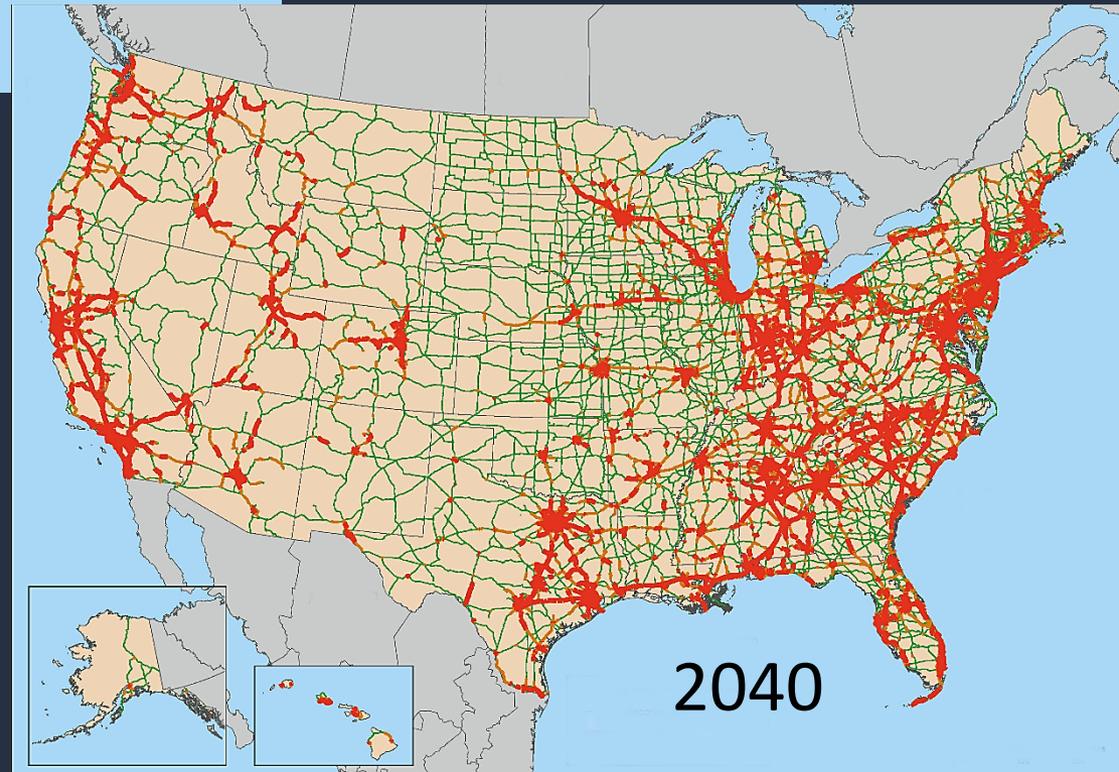
Accelerated Construction Skill Sets

<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

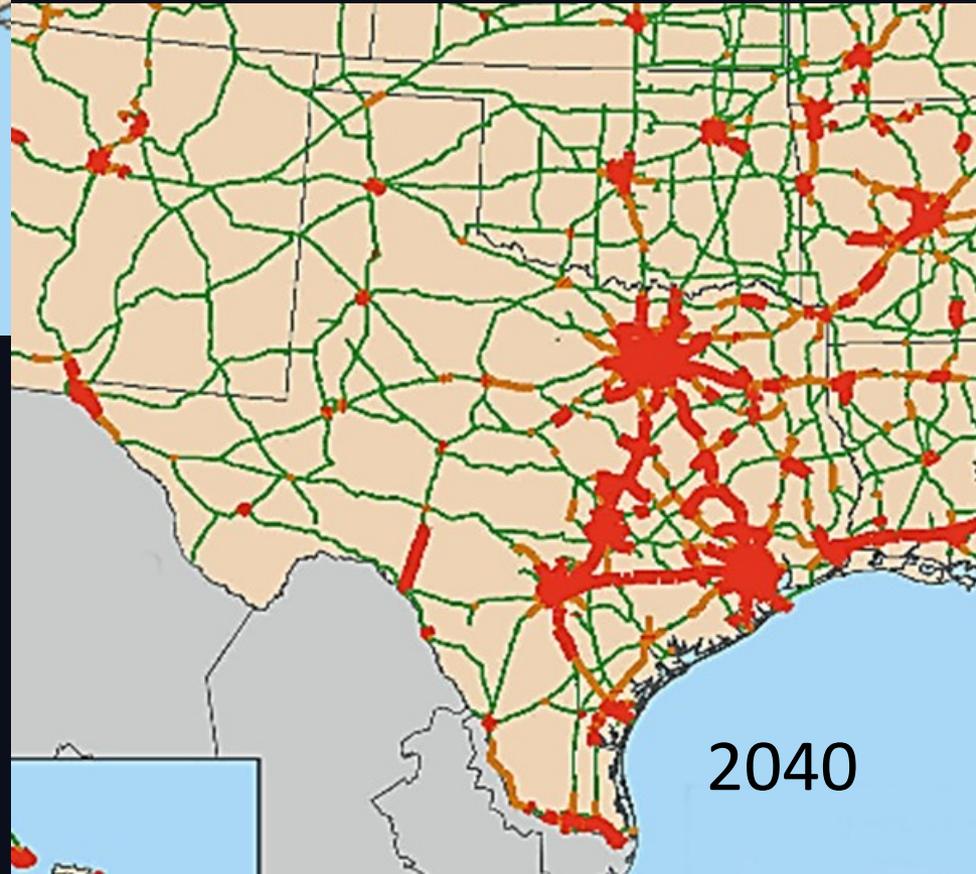
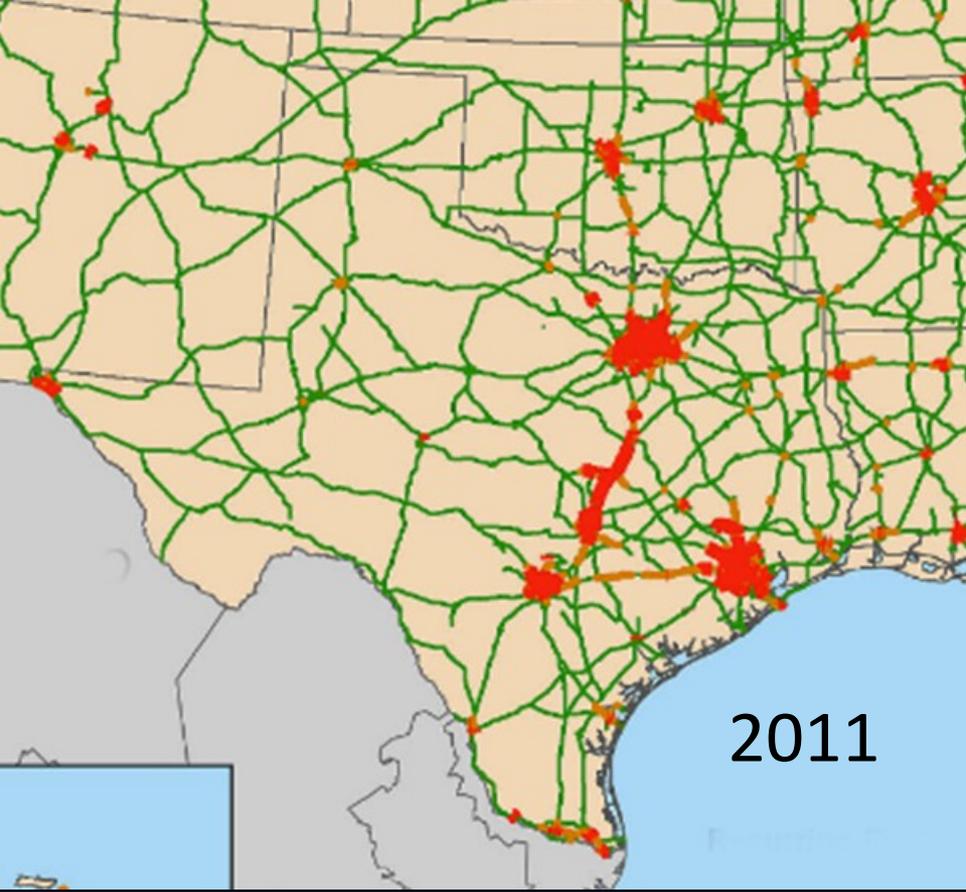


2040

Recurring Peak-Period Congestion

-  Uncongested
-  Congested
-  Highly Congested

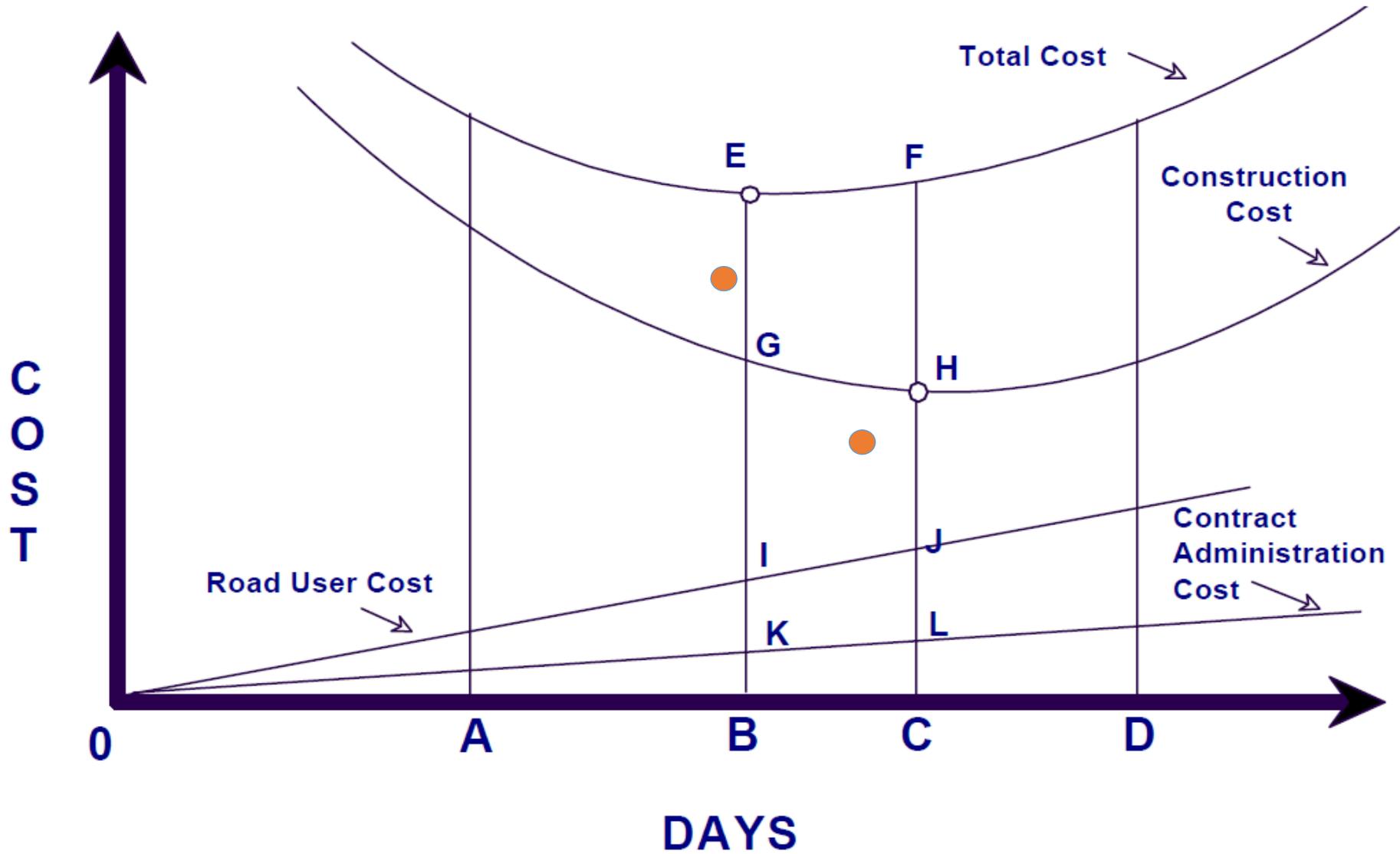
Peak-Period Congestion on NHS



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)

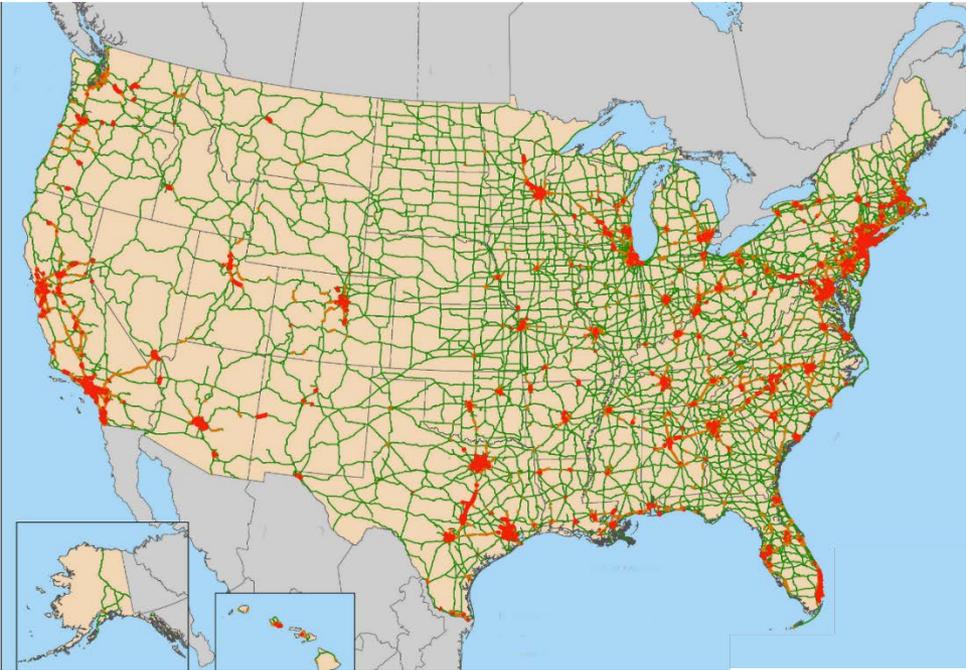
- Complex project involving utilities
- Prequalified bidders
- Req'd 12-hr days, 7 d/wk (14 on/2off)
- 3 milestones with up to \$120k bonus for each
- Penalty - \$20k/day
- Urban area – intersections on weekend, noise mitigation at night
- PR campaign was successful

Summary

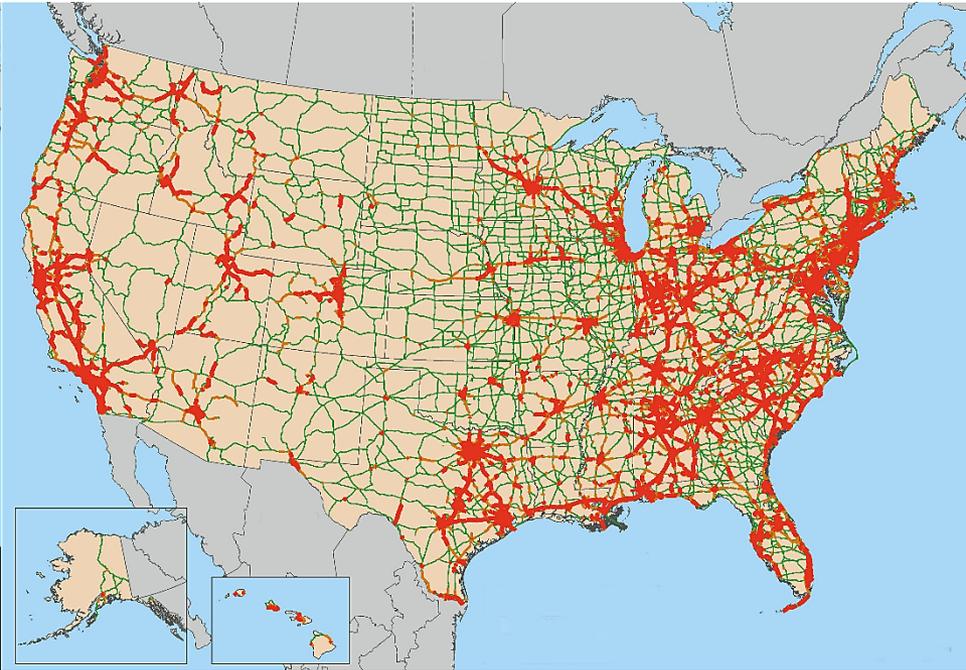


- Accelerated construction not new
- Requires
 - Right application
 - Incentives/disincentives
 - Recognition of and planning for risks
 - Flexibility on part of agency and contractor
 - Innovative thinking
 - Public engagement
- Will become more standard with time

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

Lubbock

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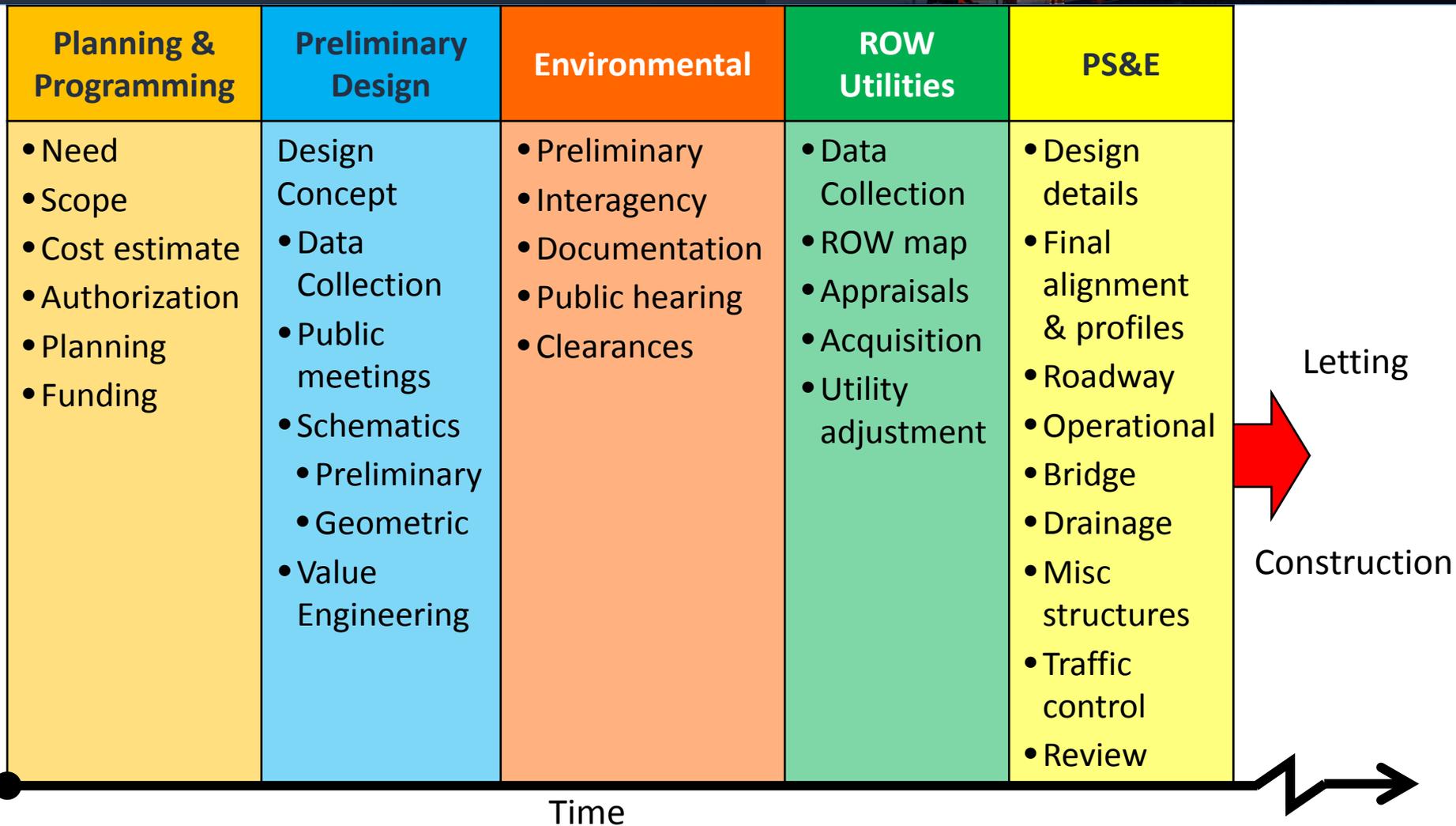
Outline



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



Project Delivery



Economic Considerations-Examples

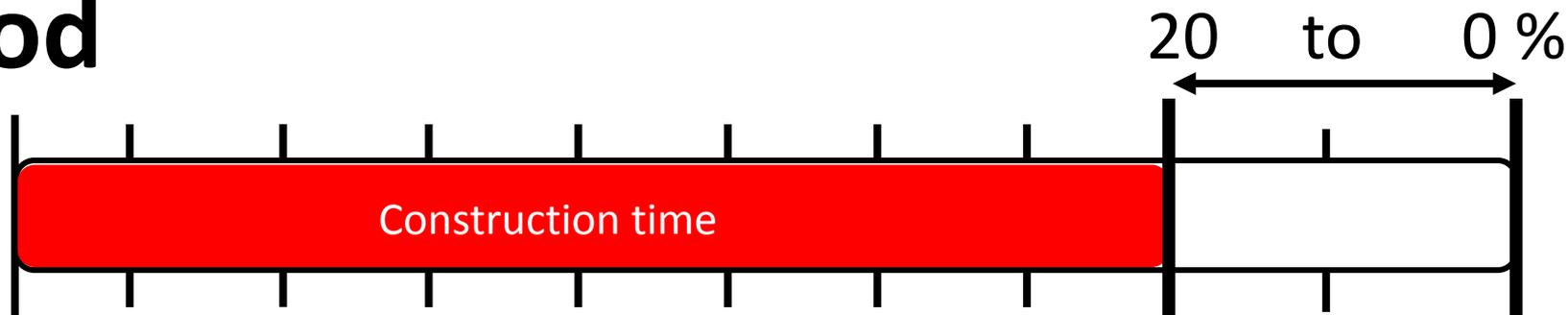
Project	Per Month Costs	Project Costs
Widen FM road from 2-lanes to 4-lanes (2.7 miles)	\$ 96,000	\$ 3.5M
Widen Freeway (2.6 miles)	\$297,000	\$17.8M
Interchange in urban area (1.5 miles)	\$447,000	\$ 5.1M



Acceleration Goals

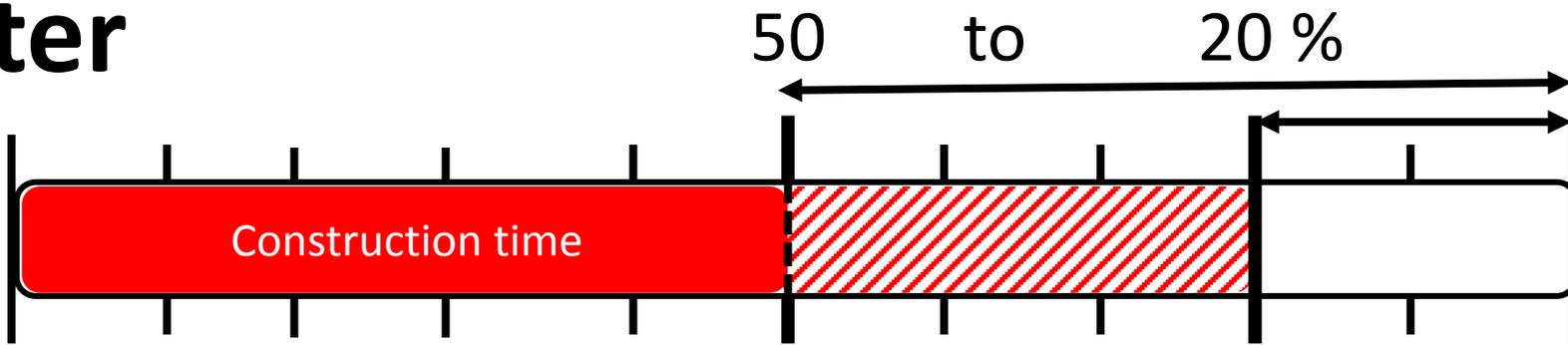


Good



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



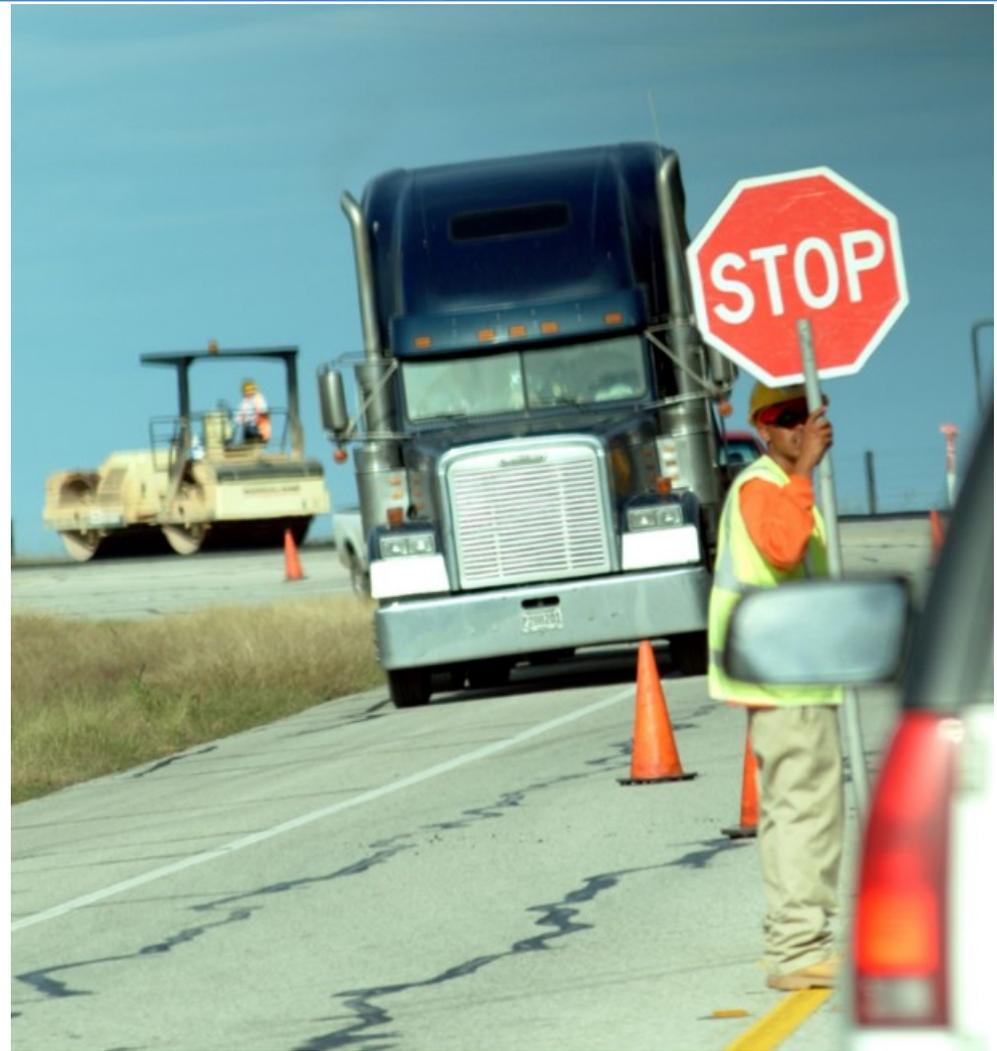
Reduce Construction Time

- Bridges/Culverts (ABC)
- Pavements





Not for every
project



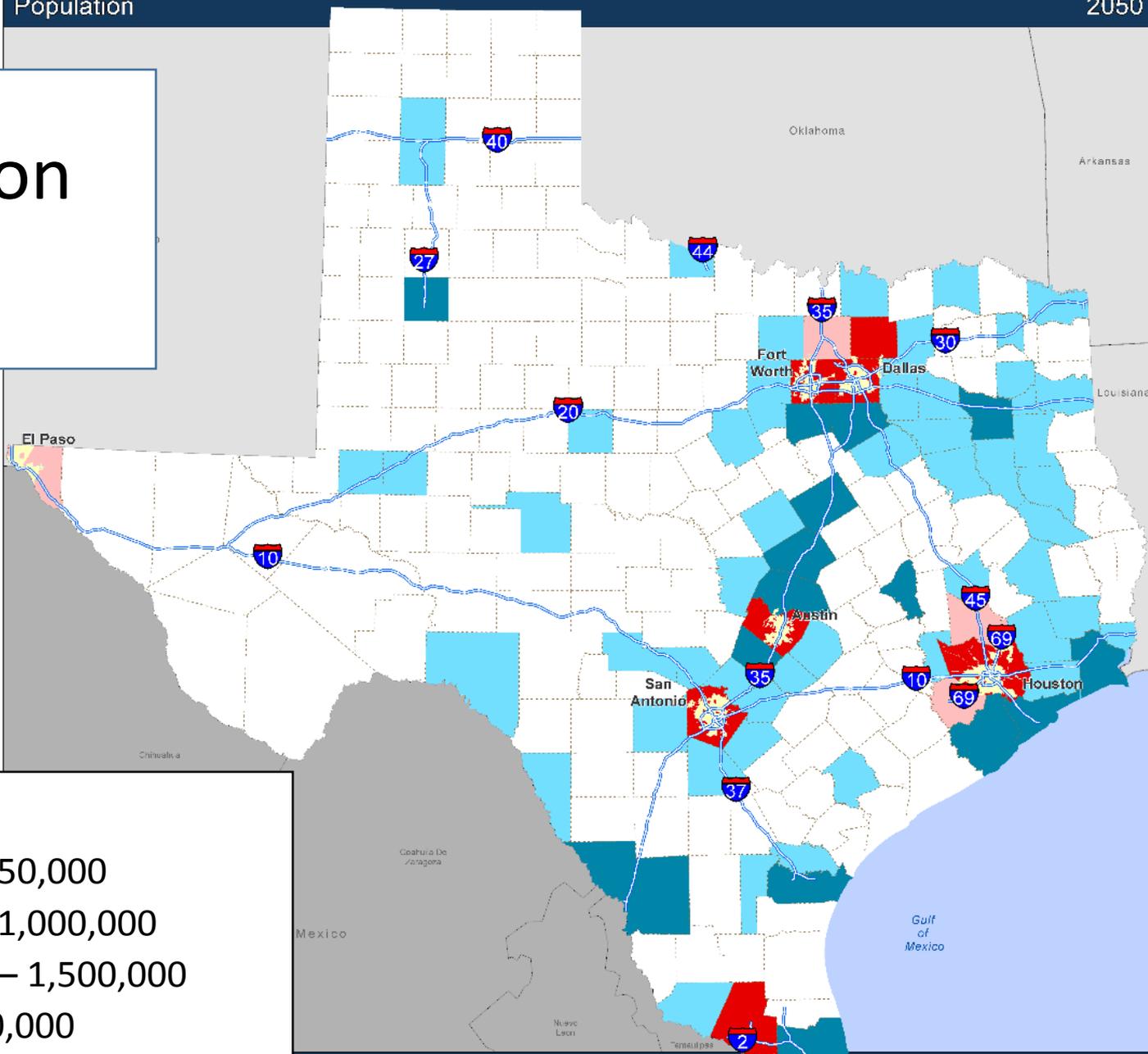
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- Background
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Population 2050



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



2017 Unified Transportation Program (UTP)

2017-2026
Transportation Planning & Programming



Unified Transportation Plan



We Build Texas

*Field Guide to
Successful Project Delivery*

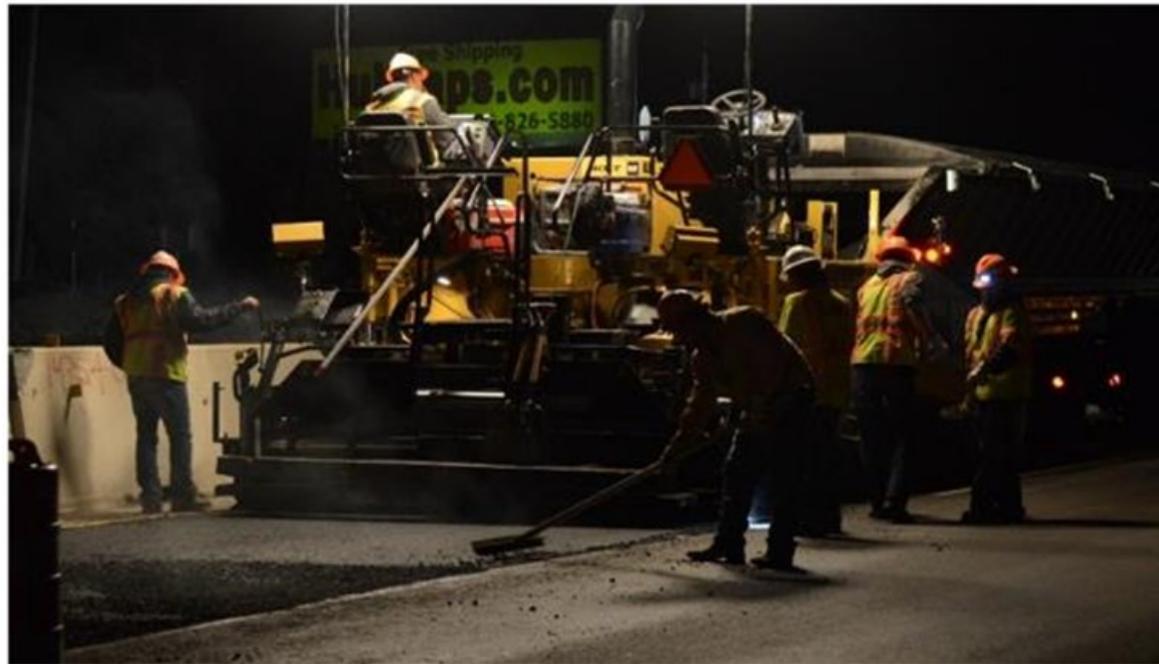


We build Texas – Safely
We build Texas – Quality
We build Texas – On Time
We build Texas – Together

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



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Materials

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



Equipment

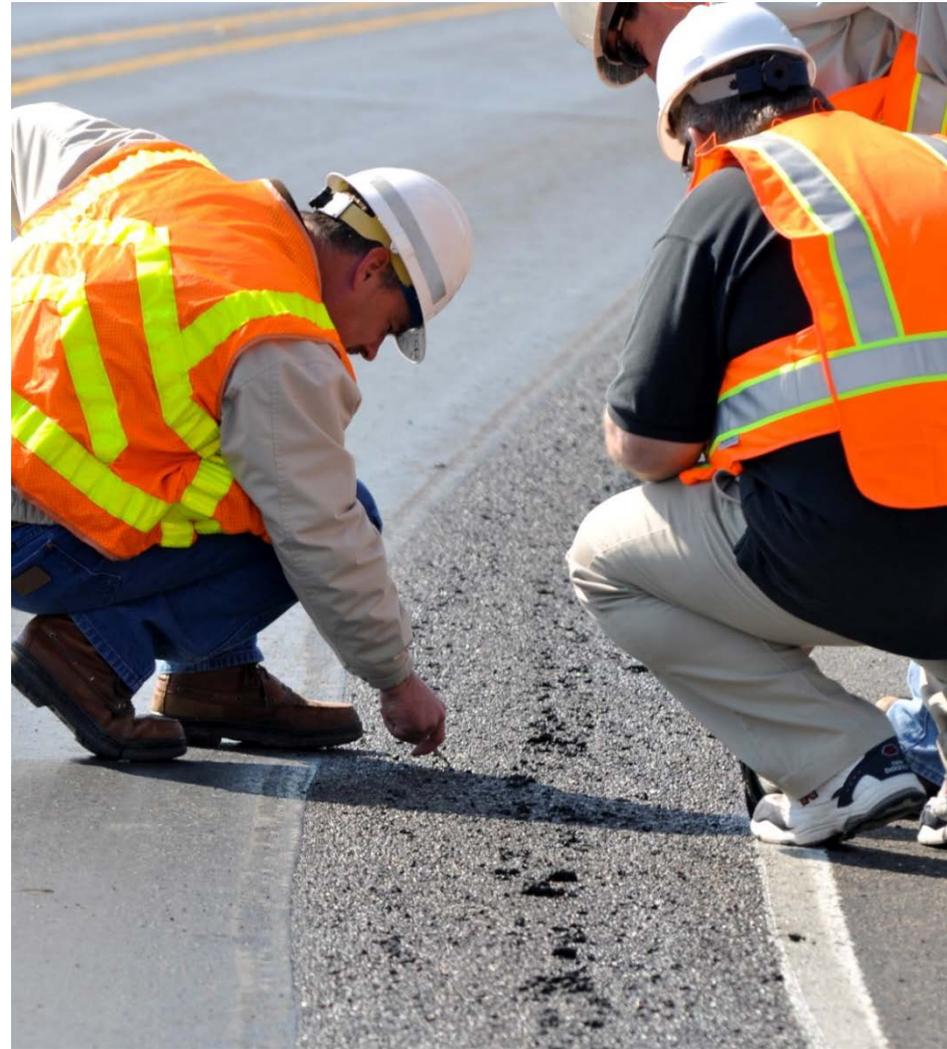


- Materials handling
- Demand for equipment
- Prototype/production unit/redesign
- Cost



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

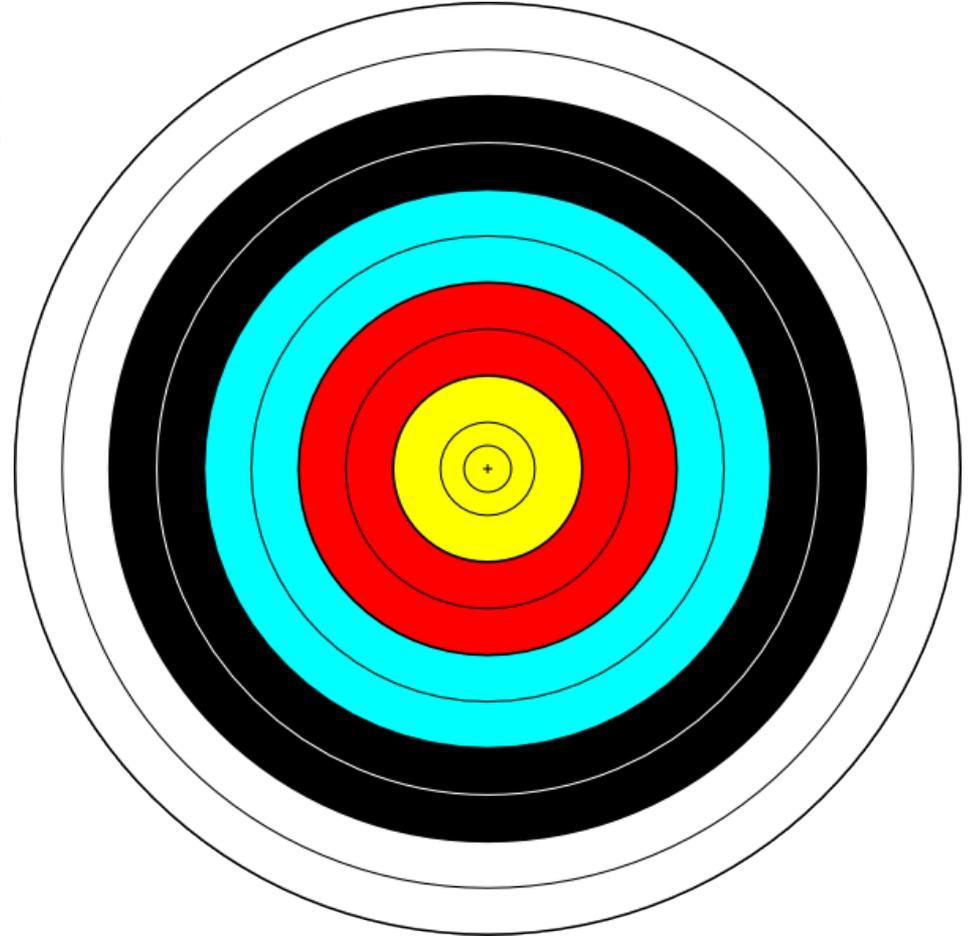
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- **Workshop Outcomes**



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



Lubbock

MCM Elegante Hotel and Suites
November 8, 2017



District Workshops on Accelerated Construction Economic Screening Tools

AC-PP-17-04

David Ellis

Brianne Glover

Lubbock

MCM Elegante Hotel and Suites

November 8, 2017



*Texas
Department
of Transportation*



Project Level Economic Screening Tool



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

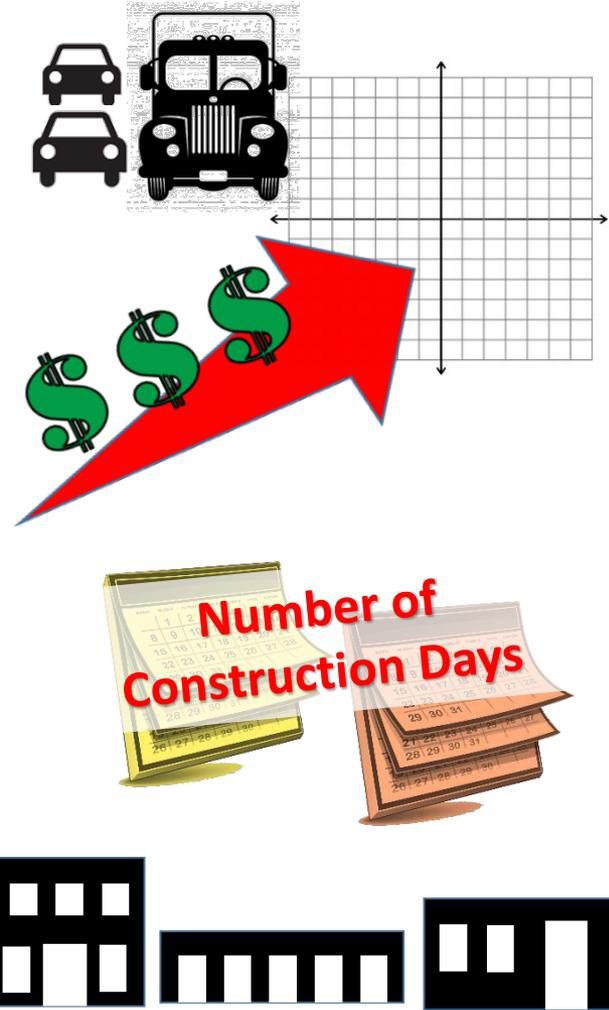


Economic Impact

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

215,000

Percent Trucks

15%

Project Region

Urban

Retail (SQFT)

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Project Level Economic Screening Tool



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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



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

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

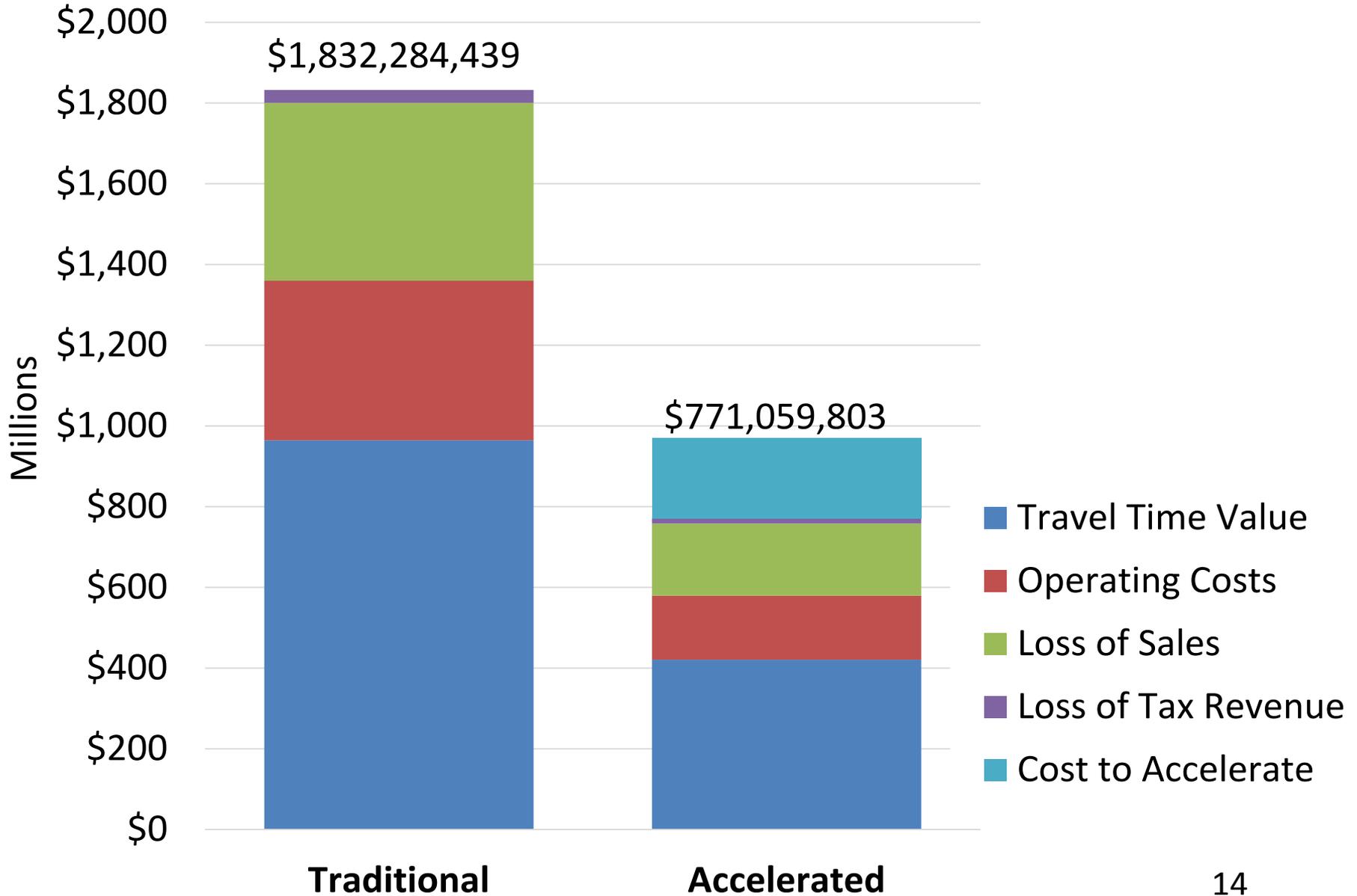
Values

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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Lubbock
MCM Elegante Hotel and Suites
November 8, 2017



*Texas
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Institute*

District Workshops on
Accelerated Construction
Project Development
AC-PP-17-05
Michael Bostic

Lubbock

MCM Elegante Hotel and Suites
November 8, 2017



OUTLINE



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



TxDOT RESOURCES

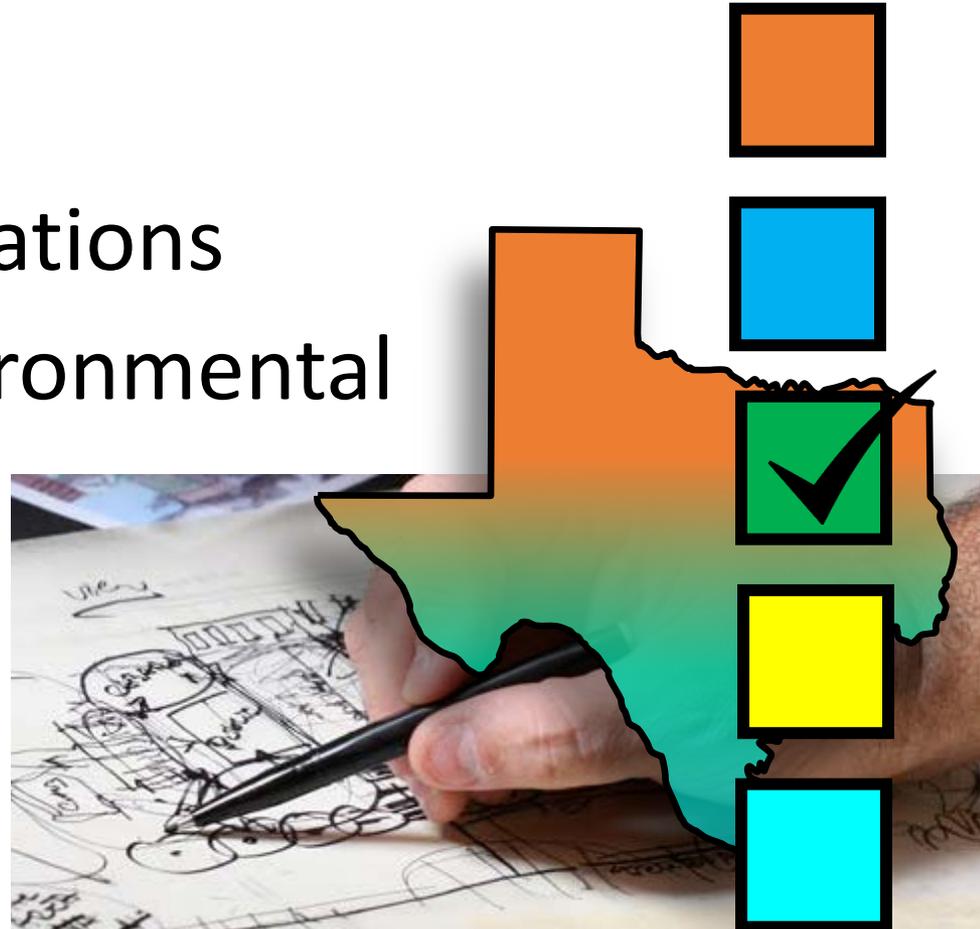


- Project Development Process Manual-2017
- Bridge Project Development Manual-2016
- PS&E Preparation Manual-2016
- Roadway Design Manual-2014
- Bridge Design Manual-2015
- Bridge Detailing Guide-2016
- Pavement Design Manual-2011
- Hydraulic Design Manual-2016
- Texas Manual on Uniform Traffic Control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



PROJECT SELECTION & PLANNING

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

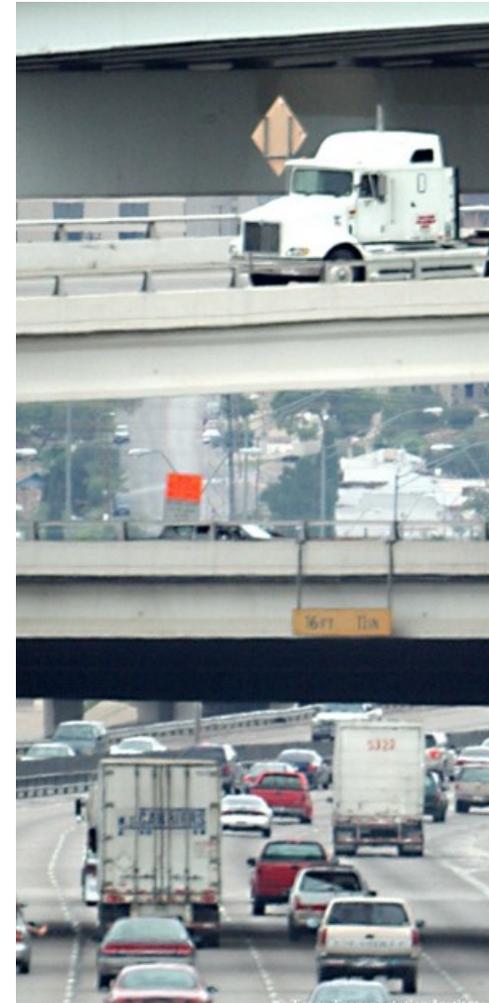


PROJECT SELECTION & PLANNING

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

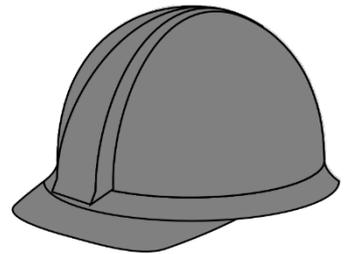
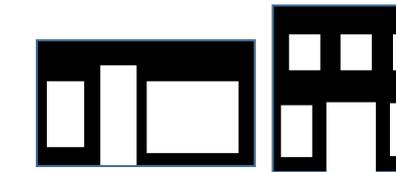
- Rural areas
 - Impact on small towns traffic flow
 - Impact on small town businesses
 - Intersections
- Key transportation routes for major industries
 - Energy development
 - Agriculture
 - Mining



PROJECT SELECTION & PLANNING

Economic Considerations

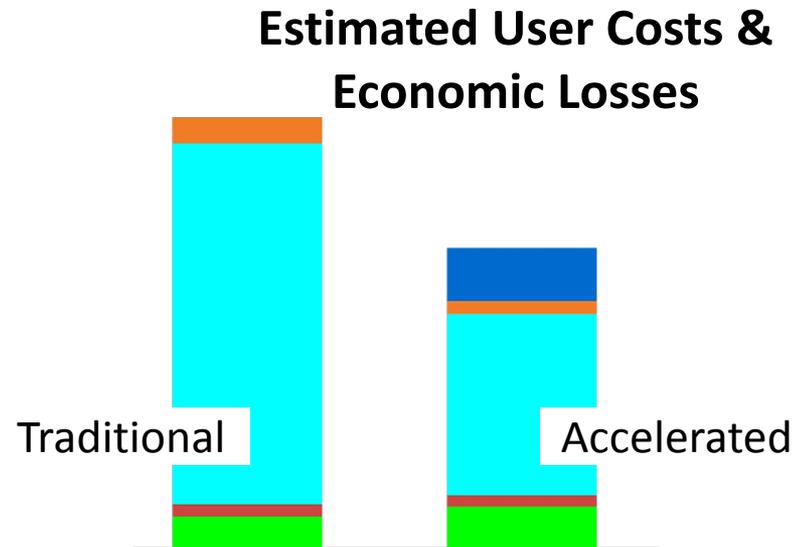
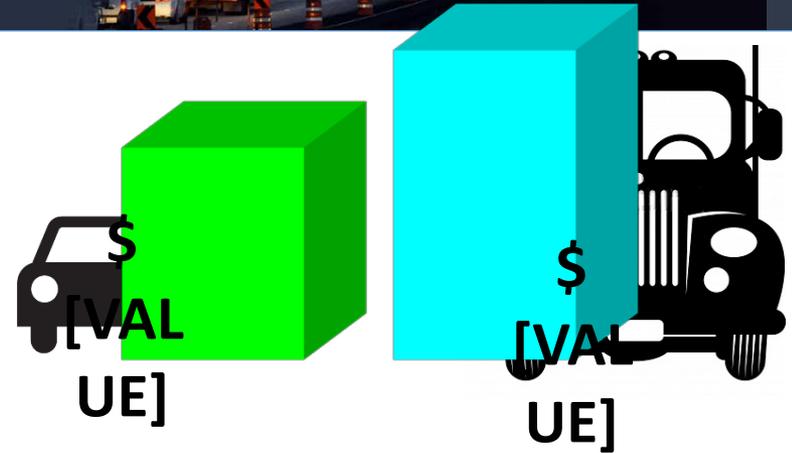
- Agency Administrative Costs
- Road User Costs
- Non-User Costs
(adjacent businesses)
- Construction Costs
- Contractor Management Costs



PROJECT SELECTION & PLANNING

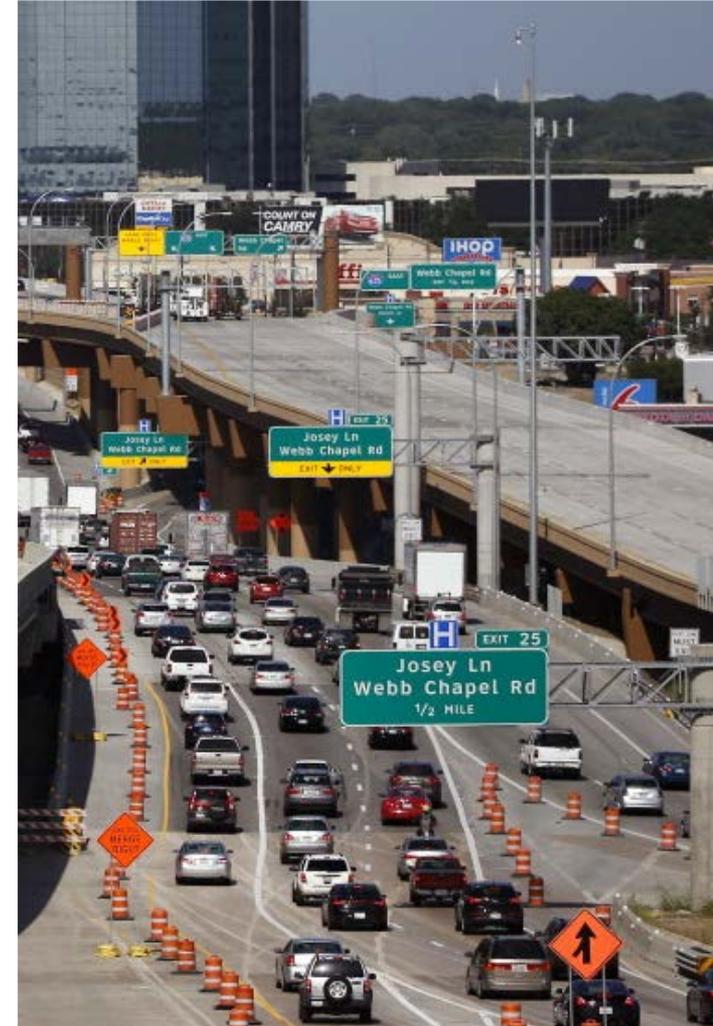
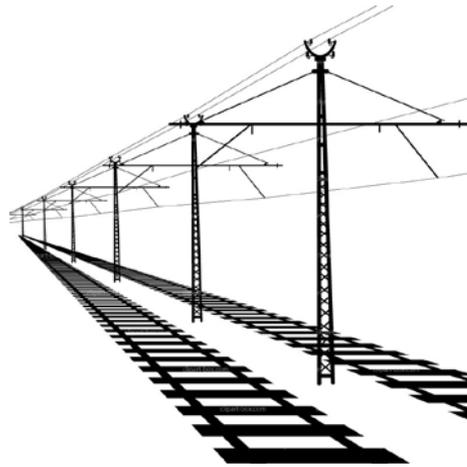
Calculation Tools

- 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



**PUBLIC
MEETING**



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

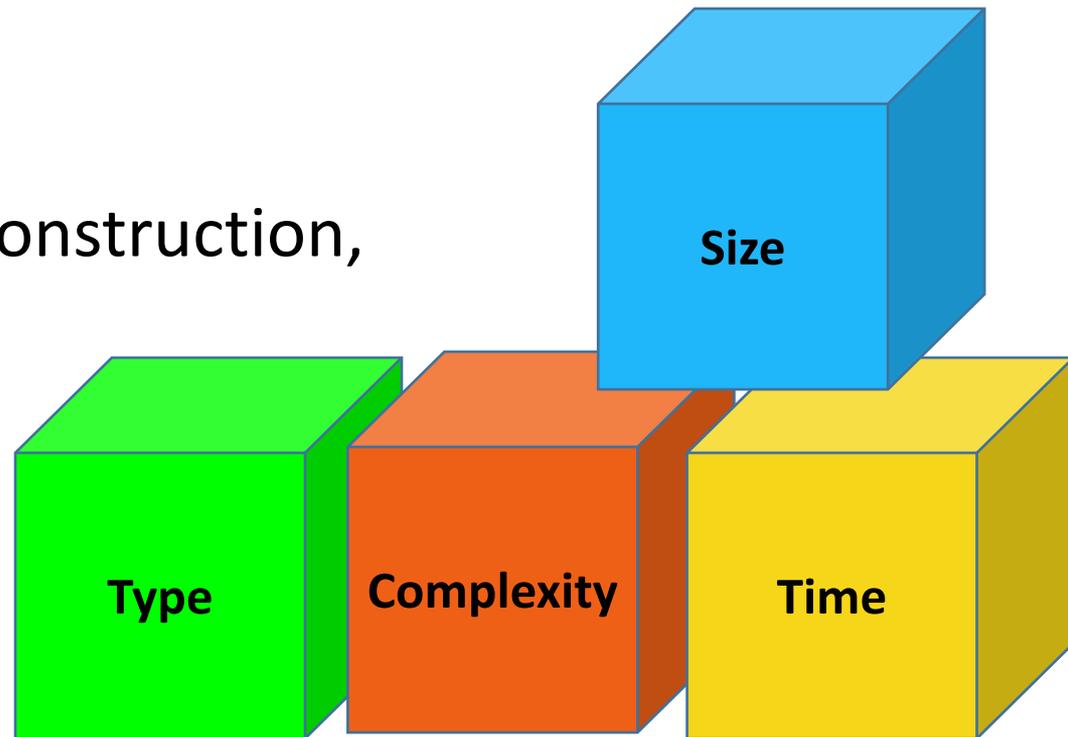


Contracting Methods



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

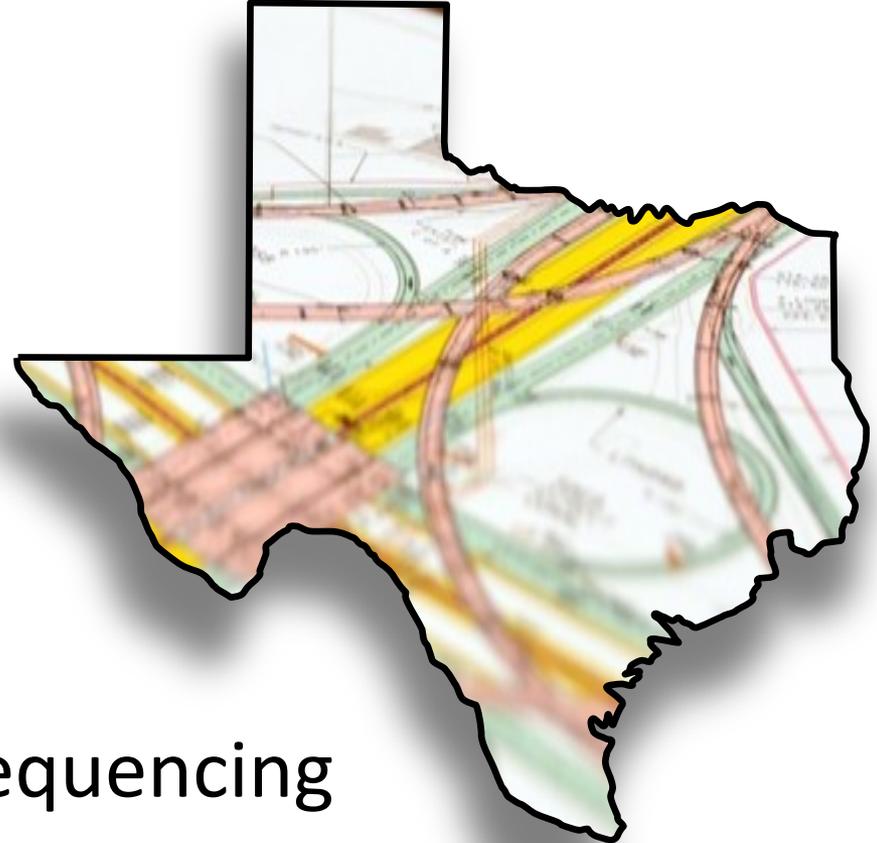
- A - Traditional bid for the unit prices multiplied by the contract quantities
- B - Time to complete the project x daily road user costs
- Road user costs provided by TxDOT
- Contract state minimum and maximum work days
- Contractors bids “time” is the “time” used for contract cost adjustments

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

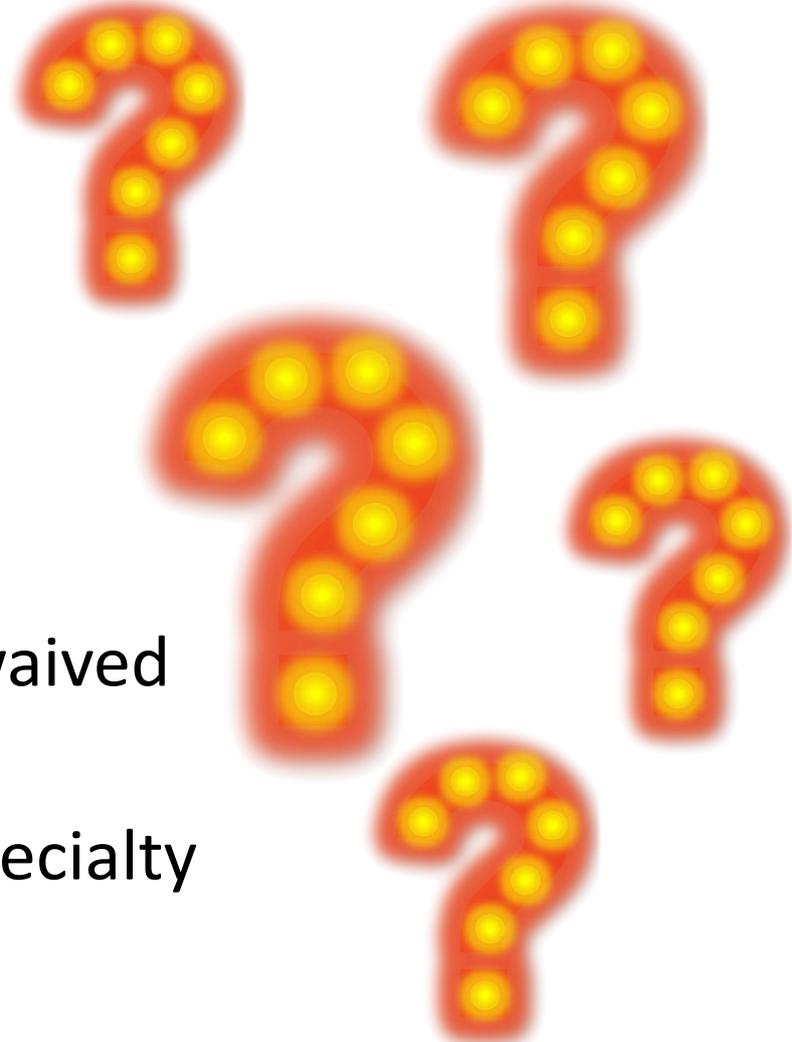


CONTRACTOR SELECTION



TxDOT Prequalification

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

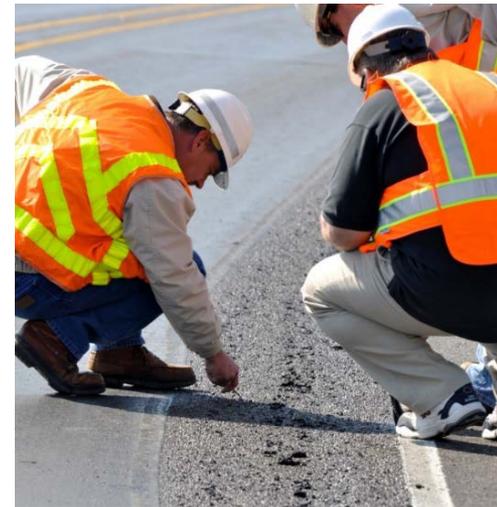


Contractor Selection



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

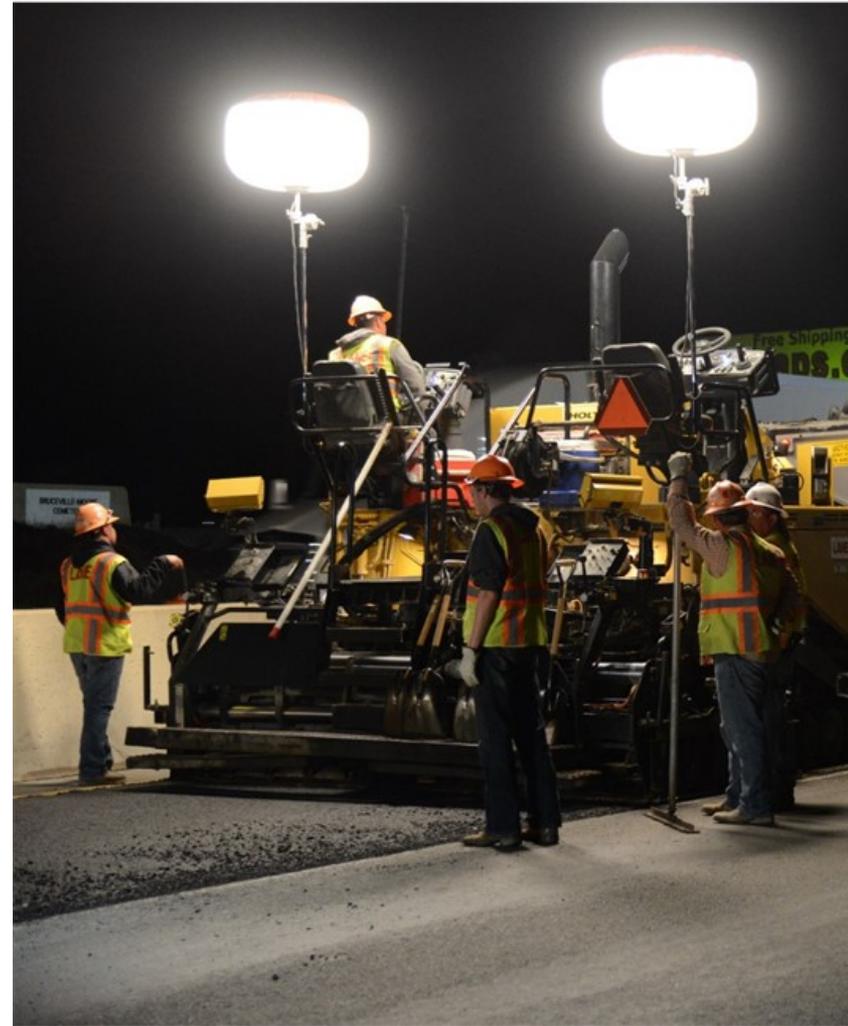
- Agreement to
 - Solve issues at low level in organizations
 - Openness to change as information becomes available
 - Attention to detail
 - Focus on project with unselfish effort
 - Take steps to insure that no interruptions take place
 - Co-locate key personnel on project
 - Empower workforce to make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

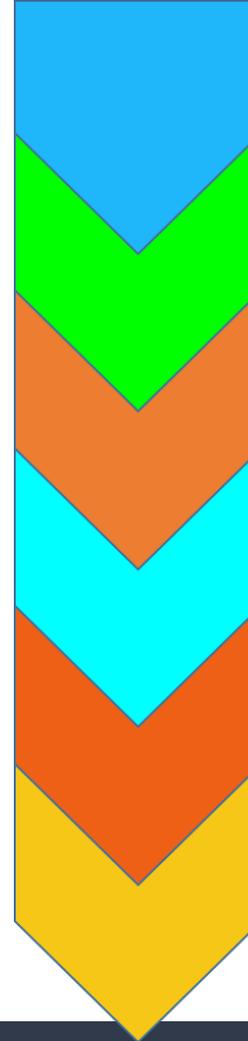
General Considerations

- 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



Lubbock

MCM Elegante Hotel and Suites

November 8, 2017



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ACCELERATED BRIDGE CONSTRUCTION IN TEXAS (AND BEYOND)

Steven Austin, P.E.

TxDOT Bridge Division



Accelerated Bridge Construction (ABC) Techniques

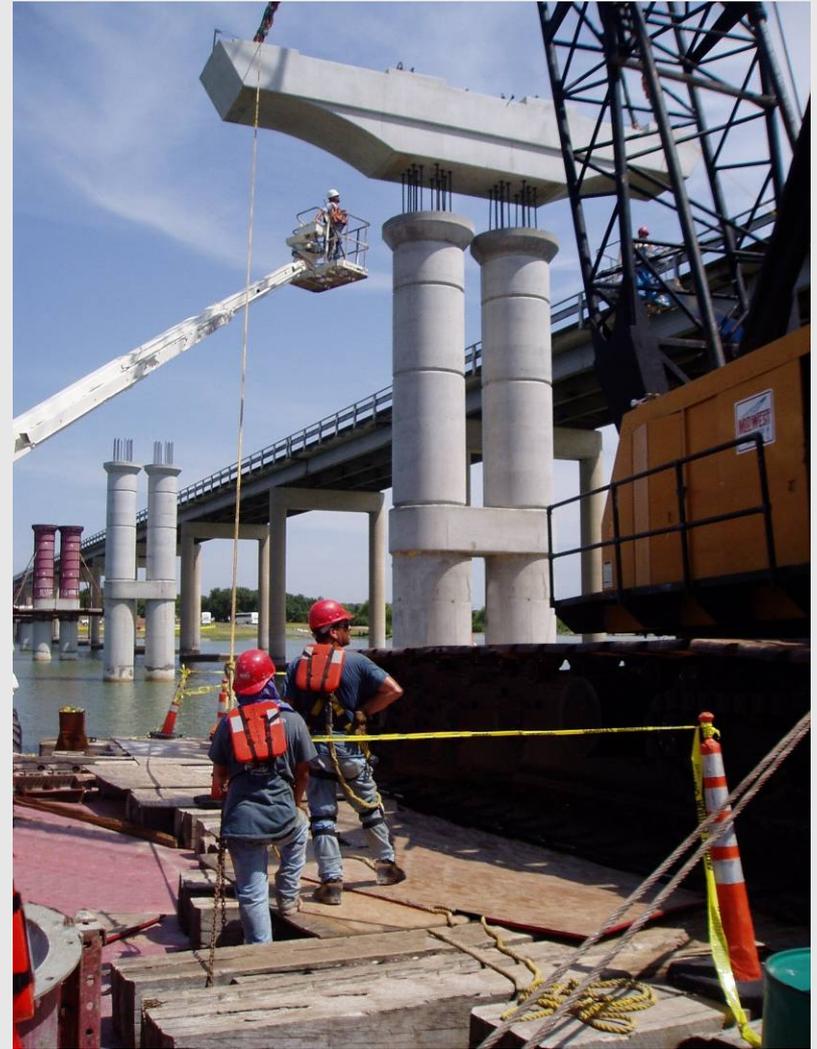
- 1 Prefabricated Elements
- 2 Self Propelled Modular Transporters (SPMTs)
- 3 Modular Units
- 4 Lateral Slide-in Bridge Construction



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.



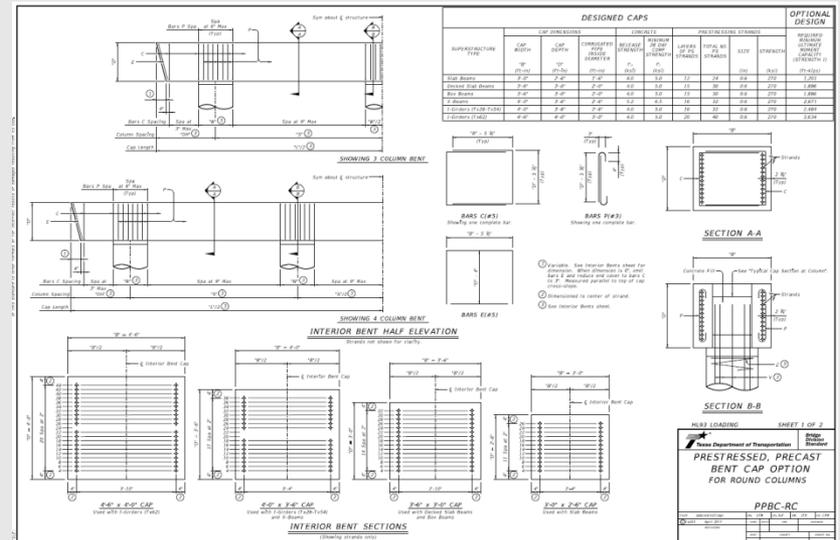
TxDOT's Bread & Butter: Girders and Deck Panels



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

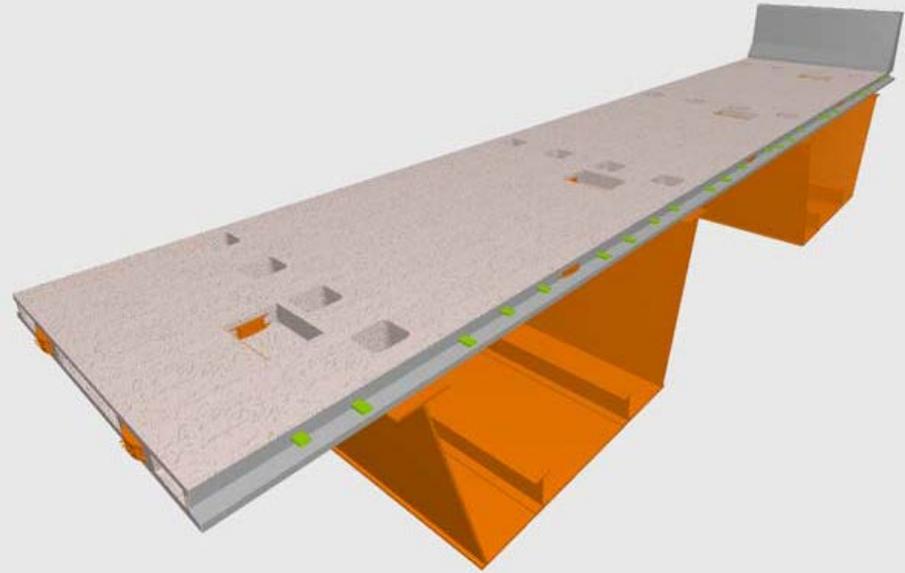
Precast Bent Cap

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



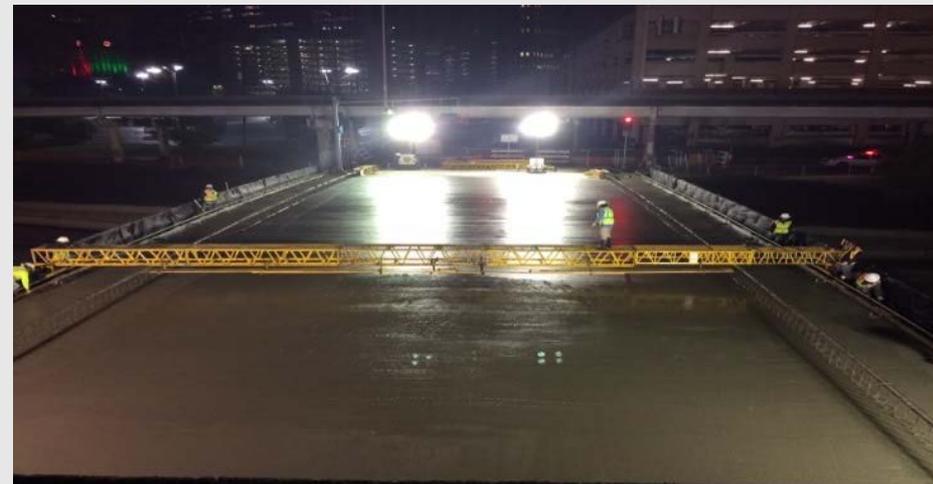
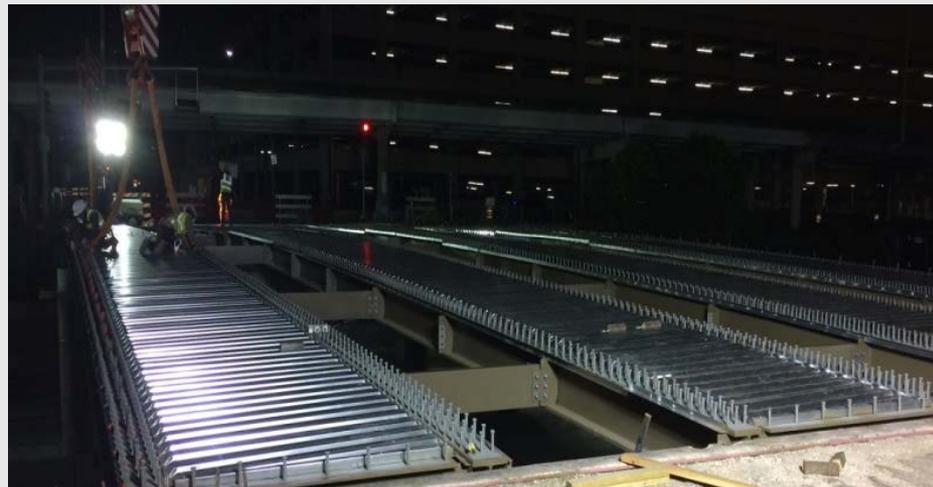
New Bearing Seat

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



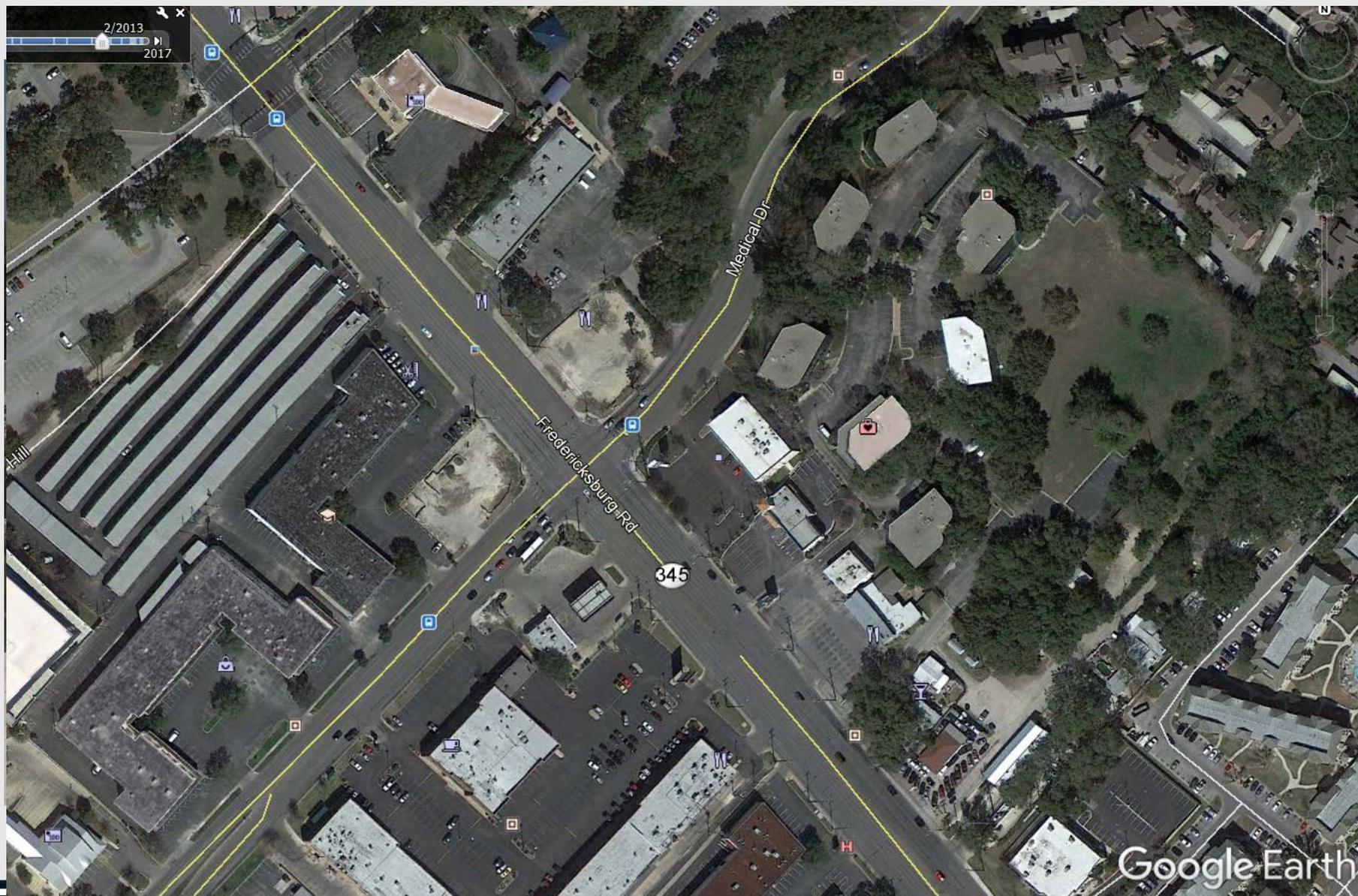
Lateral Slide-in



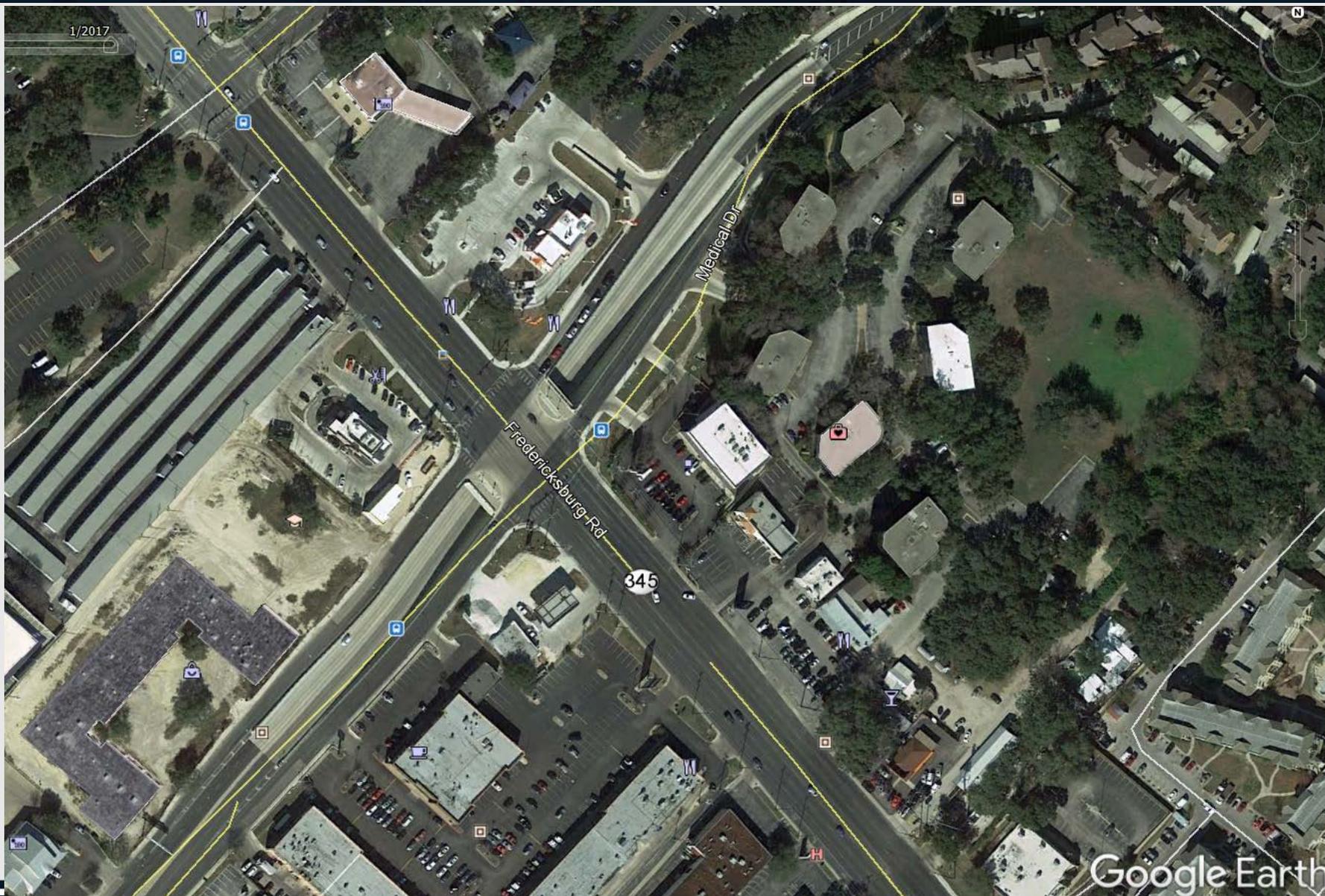
Lateral Slide-in – LP 345 / Fredericksburg Rd (San Antonio)



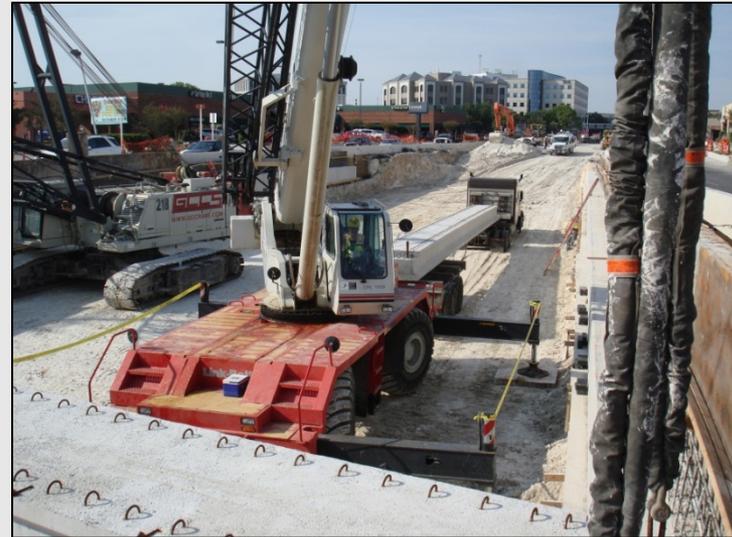
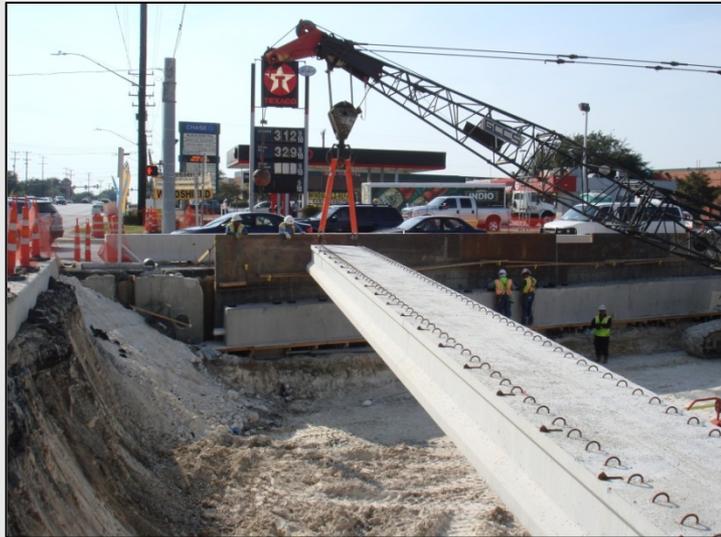
Lateral Slide-in – LP 345 / Fredericksburg Rd (San Antonio)



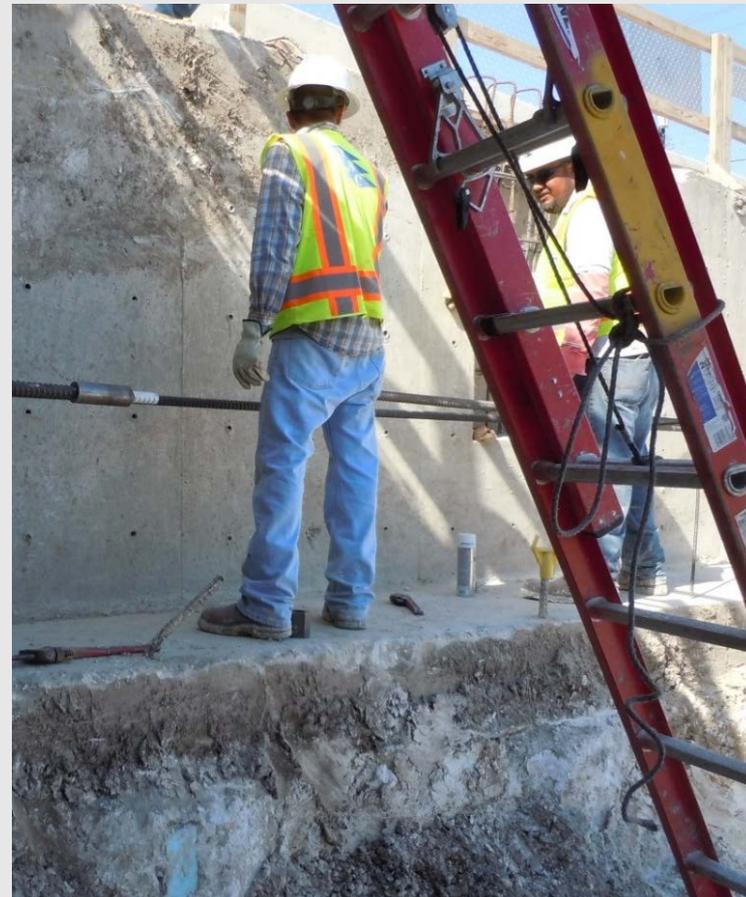
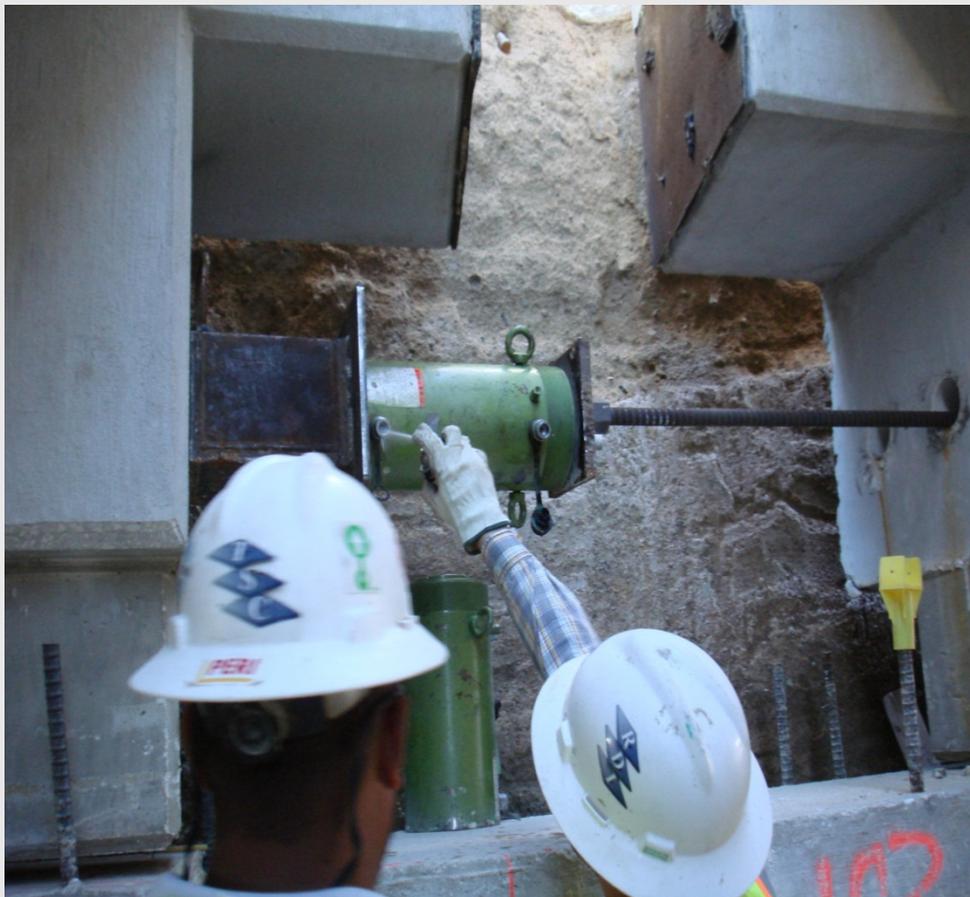
Lateral Slide-in – LP 345 / Fredericksburg Rd (San Antonio)



Lateral Slide-in – LP 345 (San Antonio)



Lateral Slide-in – LP 345 (San Antonio)





QUESTIONS?

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Accelerated Bridge Construction (Roll-In Method)





15 FT 8 IN

PAUL
STONN



27 5:22PM



27 5:26PM



27 5:12PM



27 5:14PM



CONCRETE
10032-01-038

15 1:12PM







8 6:12PM



8 6:18PM





15 1:18PM



19 8:59AM



19 12:33PM



19 1:06PM



26 10:19AM



19 5:59PM



26 1:21 PM



26 1:43PM



26 12:02PM



26 2:01PM



26 2:21PM



19 1:24PM





16 FT 9 IN



ACCELERATED CONSTRUCTION PRACTICES IN DESIGN

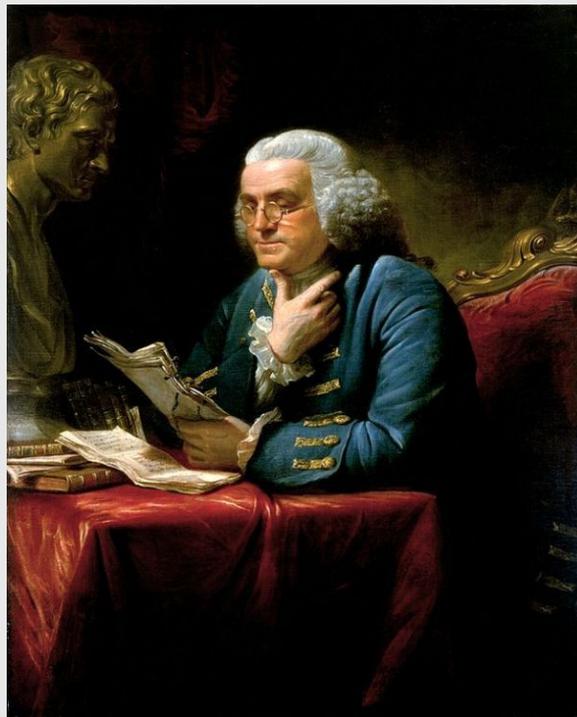
Planning for Success





DESIGN STRATEGIES

- “Perhaps the history of the errors of mankind, all things considered, is more valuable and interesting than that of their discoveries.”



- “ Give me six hours to cop down a tree and I will spend the first four sharpening the axe”



Design Strategies to Accelerate Construction

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

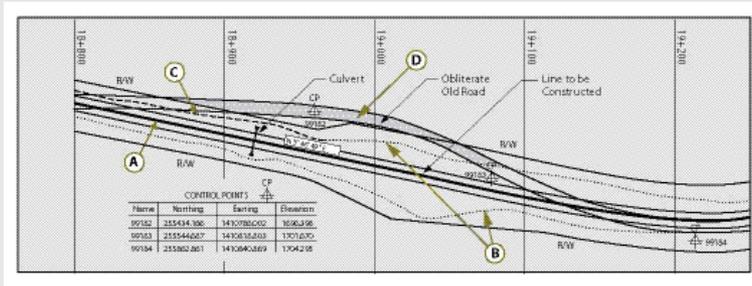
Design Strategies to Accelerate Construction

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

Design Strategies to Accelerate Construction

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

- KEEP YOUR EGO AT HOME!!!!
 - Ask for suggestions.
 - Reach out to others in the industry for ideas.



GETTING INTO THE DETAILS



Getting into the Details

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

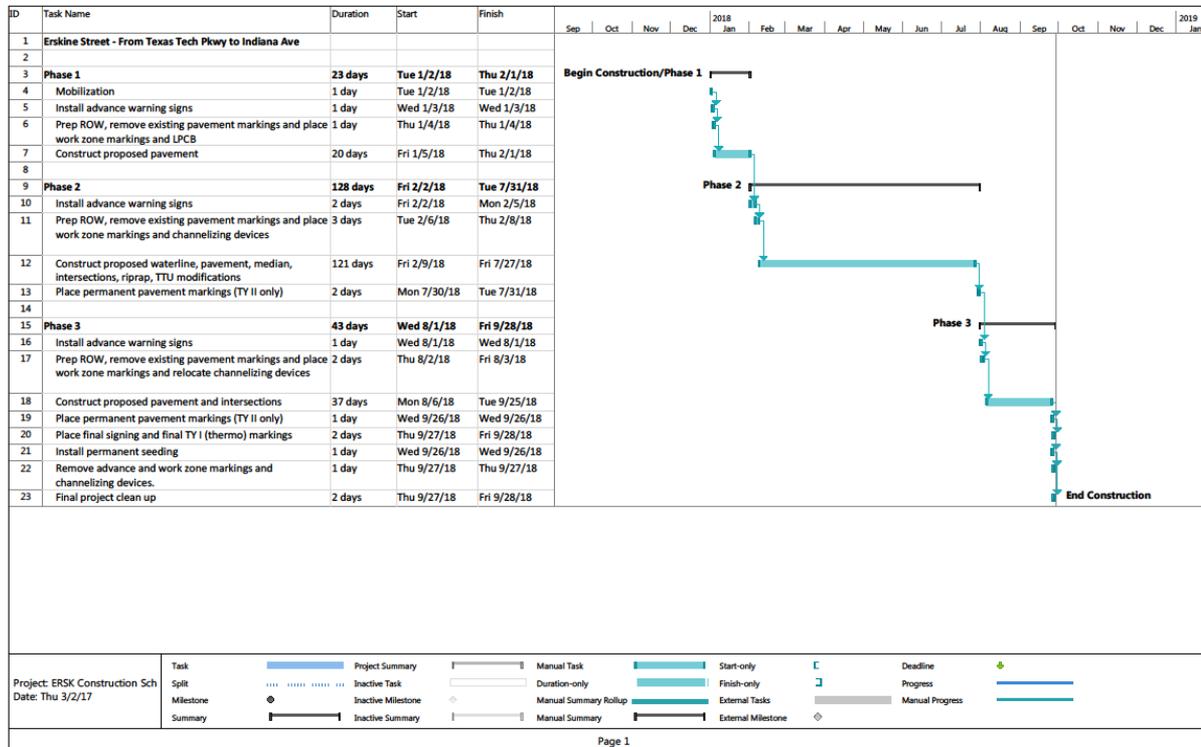
Getting into the Details

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

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

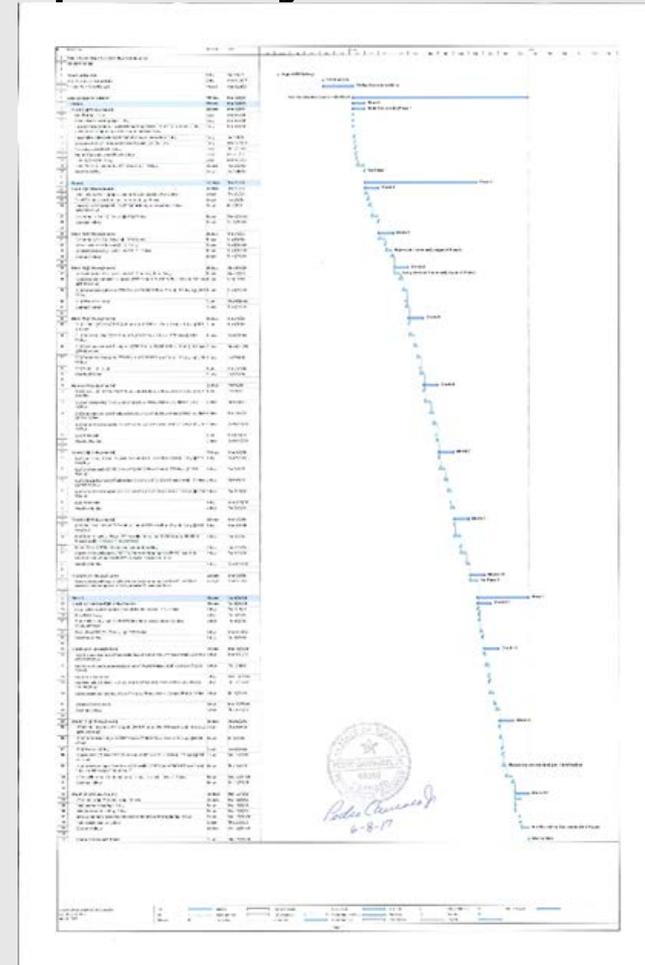
Getting into the Details

- Schedule the project appropriately.
 - Bad Schedule.



Getting into the Details

- Schedule the project appropriately.
 - Good Schedule.



Getting into the Details

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

Conclusion

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

Our First thought Should be the Public

- “Planning is bringing the future into the present so that you can do something about it now.”

Alan Lakein





QUESTIONS?

My gift to you





ACCELERATED CONSTRUCTION: COMMUNICATION OPPORTUNITIES

Sonja Gross, PIO, Amarillo District



Recent Accelerated Construction in AMA District

▪ Bushland Bridge

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

Bushland Bridge



Recent Accelerated Construction in AMA District

▪ Bell Street Bridge

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

Bell Street Bridge



TxDOT Amarillo @TxDOTamarillo · Jul 28

At 7 tonight, we start closing I-40 at Bell Street in both directions for demolition of EB turnaround bridge. Slow down, follow detours.

Bell Street Bridge Replacement (at I-40)

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

Stakeholders – Building Trust

- Who are your stakeholders?
 - Understand, appreciate and consider community and stakeholder values and needs
 - Strive to incorporate or address stakeholder values in the evolution of the project
- Be responsive and consistent when distributing information and when establishing and building community trust
- Be a good neighbor during disruptive construction
 - Develop outreach correspondence and detour maps for distribution to stakeholders that will be impacted during construction

Communications Toolbox

- TxDOT's Public Information Officer is your #1 tool!
- Community Outreach (as warranted)
 - Presentations to local community groups
 - Newsletters and project trackers
 - Town Hall meetings/Open Houses
 - One-on-One meetings with adjacent and affected businesses
- Media Partners
 - Provide regular and transparent updates
 - Offer live shot opportunities with work progressing in background
 - Morning shows – radio and television
 - Take media on tours of projects

■ Traditional Tools

– Press Releases

- Weekly e-blasts with up-to-date lane closure information (subscribers)

AMARILLO AREA LANE CLOSURE REPORT

Week of Nov. 6, 2017

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

– Social Media

– Project websites

– Maps, fliers

– Digital Messaging Signs



Outreach Techniques

- Communicate traffic impacts early and often
 - Media and general public
- Develop and provide easy to understand detour maps
- Coordinate with on-road traffic management systems – dynamic messaging system
- Coordinate with emergency and traffic management services
 - Police, fire, ambulance, school fleet services
- Coordinate with sister agencies – transit and regional mobility authorities
 - In Bushland, it was imperative that we regularly communicated with the school system's fleet superintendent because not only did closure of the RM road impact the bus route, it also impacted his budget
 - On Bell Street in Amarillo, taxis and other transit services that served the medical community relied on accurate, up-to-date information

Lessons Learned

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

***** PIO is your #1 tool in helping keep traffic flowing as smoothly and friendly as possible! *****

End Result – Community Pride

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

Again, Thank You for a job well done!

Don Wood
Bushland ISD Superintendent

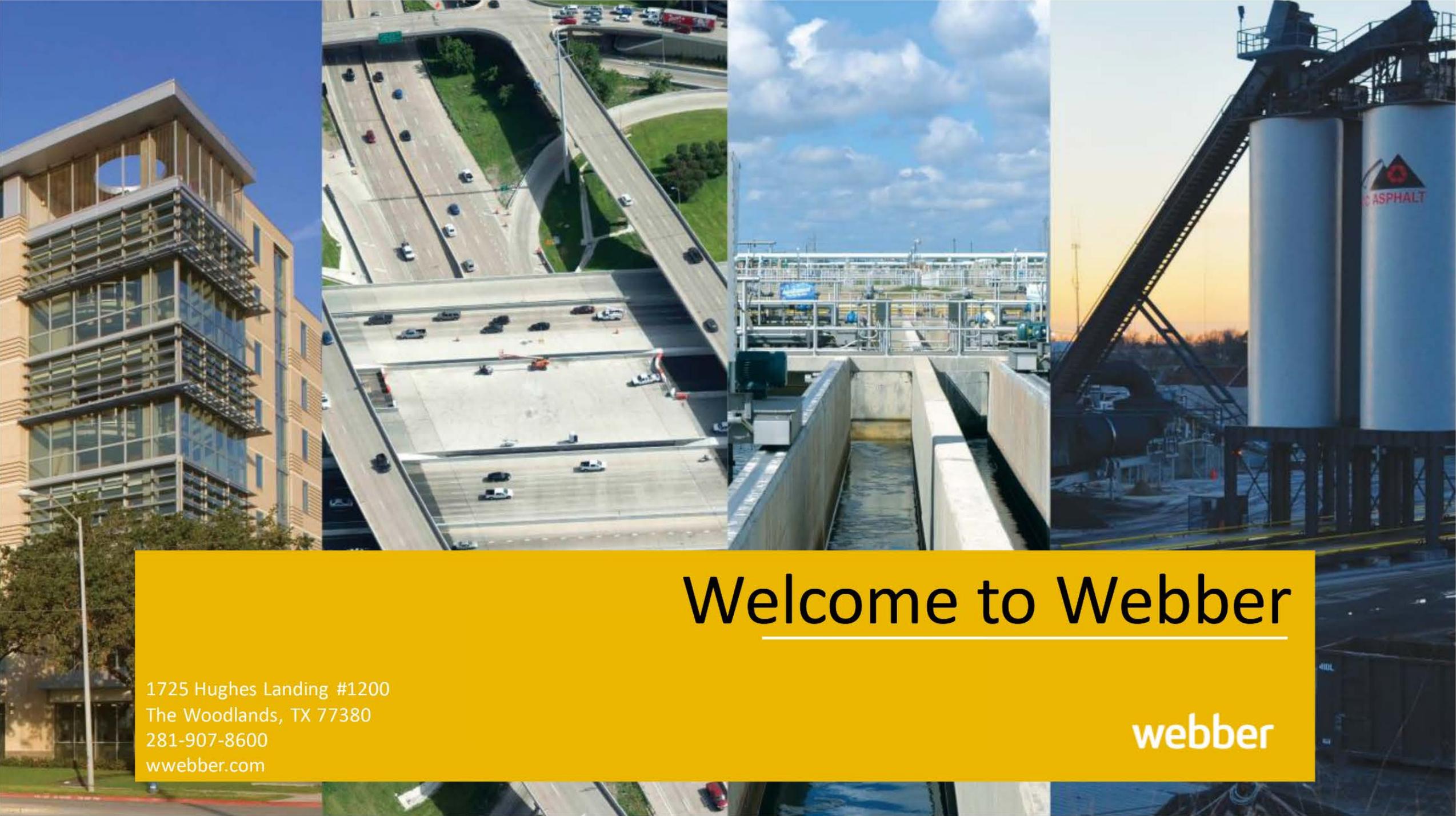
Sonja Gross

Public Information Officer

TxDOT, Amarillo District

(806) 356-3256

sonja.gross@txdot.gov



Welcome to Webber

1725 Hughes Landing #1200
The Woodlands, TX 77380
281-907-8600
webber.com

webber

WEBBER OVERVIEW

HIGHLIGHTS

webber

2015

Revenues (2015)
million

704

Employees

1579

Backlog
billion

1.074

2016

Revenues (2016)
million

781

Employees

2000

Backlog
billion

1.177

2017

Revenues (2017)
million

889

Employees

2100

Backlog
billion

1.4

WEBBER OVERVIEW

BUSINESS GROUPS

HEAVY CIVIL

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

44 projects under construction
\$1.8B in contracts



WATERWORKS

- Treatment Plants
- Purification Plants
- Pump Stations
- Desalination

35 projects under construction



COMMERCIAL

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

14 projects under construction



MATERIALS

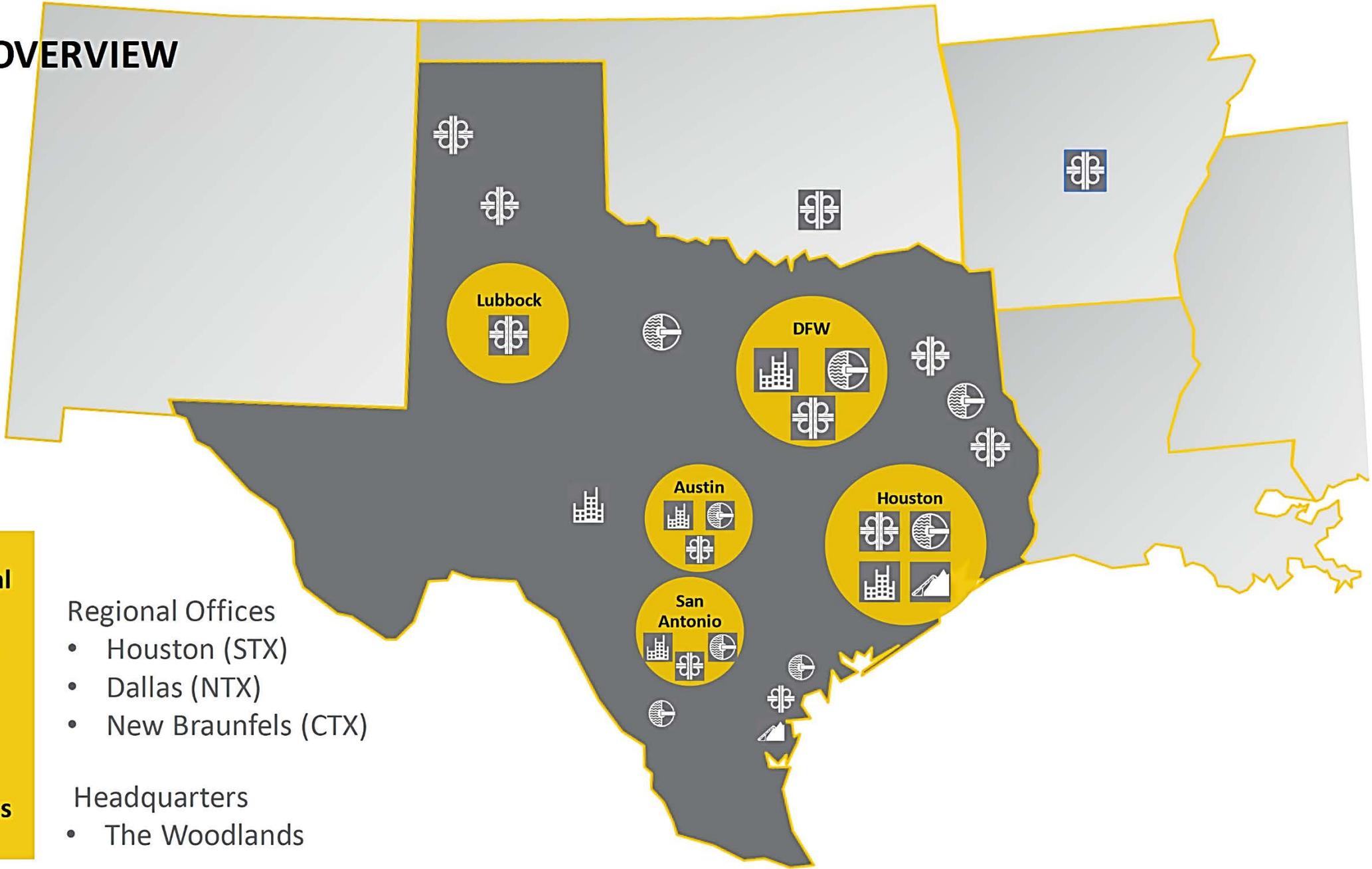
- Sand Mining
- Recycle-Milling
- Demolition

4.7M total tons of material in 2016



WEBBER OVERVIEW

PRESENCE



-  **Commercial**
-  **Heavy Civil**
-  **SCC**
-  **Waterworks**

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

- Headquarters
- The Woodlands

WEBBER OVERVIEW

HEAVY CIVIL

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



■ Highways + Bridges

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

■ Railroads + Transit

- UPRR
- BNSF

■ Ports + Marine

- Port of Galveston Cruise Terminal Expansion
- Pier 16 & 18

■ Airports

- Lone Star Airport
- Hobby Airport
- Bush International
- Tyler Airport



TXDOT
ACCELERATED CONSTRUCTION WORKSHOP

Lubbock, Texas

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

Vince Lombardi

Design Phase

Decisions here have long term consequences

- Design the project that needs to be built
- Unanswered questions at bid time =\$\$\$\$
- Constructability reviews

Preplanning is Key

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

Construction Period

Work every where you can

- Rephase the project









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

Tom Landry

webbe
r

THANK YOU

District Workshops on Accelerated Construction Regional Workshop Exercises

AC-PP-17-11

David Newcomb

Lubbock

MCM Elegante Hotel and Suites

November 8, 2017



Typical Projects



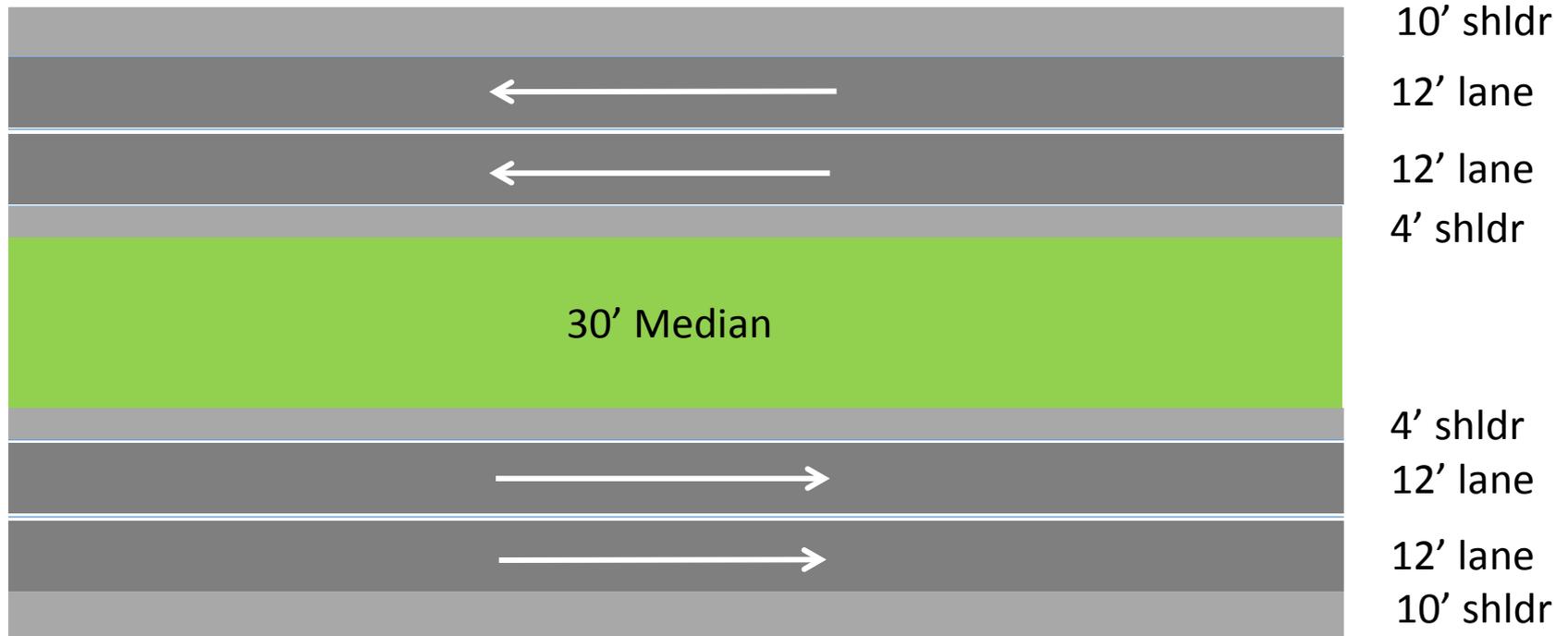
- A. Pavement Strengthening
- B. Pavement Widening
- C. Rural Intersection Reconstruction
- D. Bridge Widening
- E. Small Town Main Street
- F. Suburban/Rural Road Widening





<i>Topic</i>	<i>Facilitators</i>	<i>Recorders</i>
<ul style="list-style-type: none"> • A-Pavement Strengthening • Tumbleweed A 	Sergio Garcia -TxDOT, District Laboratory, ELP	Matt Herbstritt – TxDOT, Childress Asst. AE, CHS
<ul style="list-style-type: none"> • Pavement Widening • Cotton 	Steve Warren – TxDOT District Engineer, LUB	Falon Renfroe-TxDOT, Engineering Asst. III, AMA
<ul style="list-style-type: none"> • C-Rural Intersection Reconstruction • Bluebonnet B 	Daniel Cruz-TxDOT, Laboratory Supervisor, LBB	Francisco Marez-TxDOT, East El Paso Asst., ELP
<ul style="list-style-type: none"> • D-Widening Bridge • Caprock C 	Wes Kimmell-TxDOT, Pampa AE, AMA	Jonathon Concha-TxDOT, West El Paso Asst. AE, ELP
<ul style="list-style-type: none"> • E-Small Town Intersection • Heritage 	Corky Neukam-TxDOT, Dumas AE, AMA	Dominique Lorng-TxDOT, Design Tech III, LBB
<ul style="list-style-type: none"> • F-Suburban/Rural Widening • Cotton 	Chuck Steed-TxDOT, Director of TP&D, CHS	Eric Rodriquez-TxDOT, Design Tech III

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

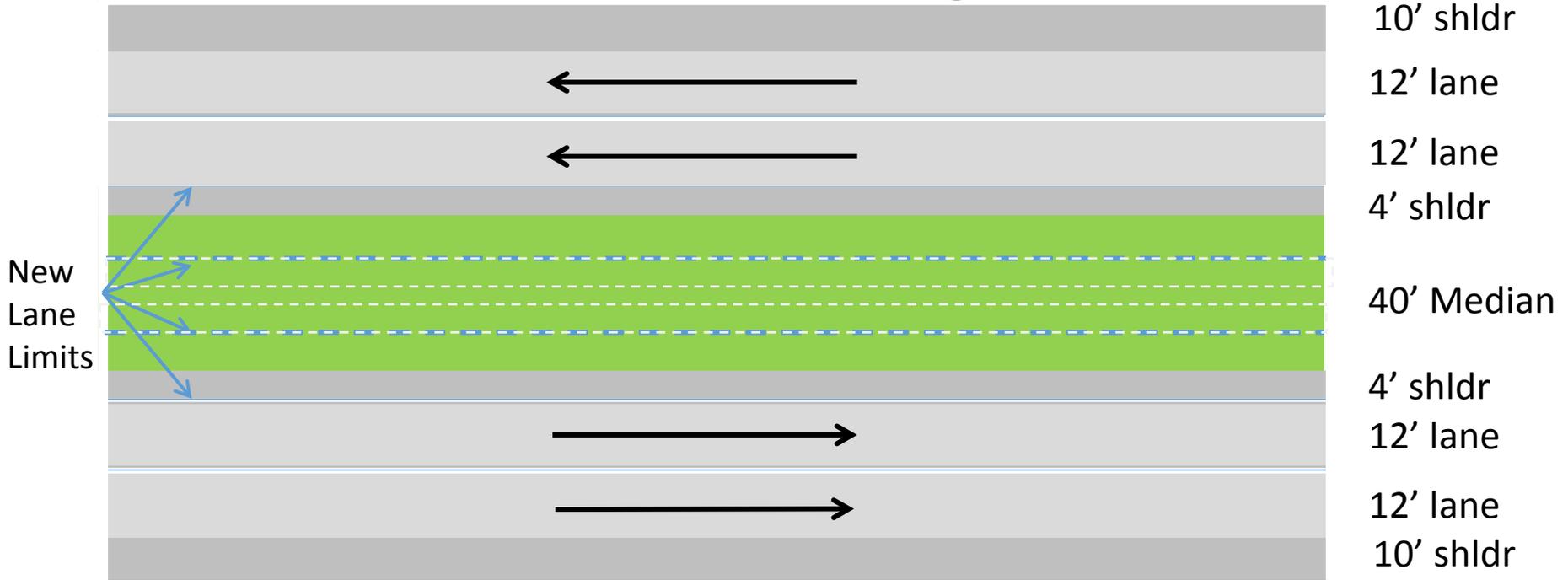
Geometric Design: High speed freeway design

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

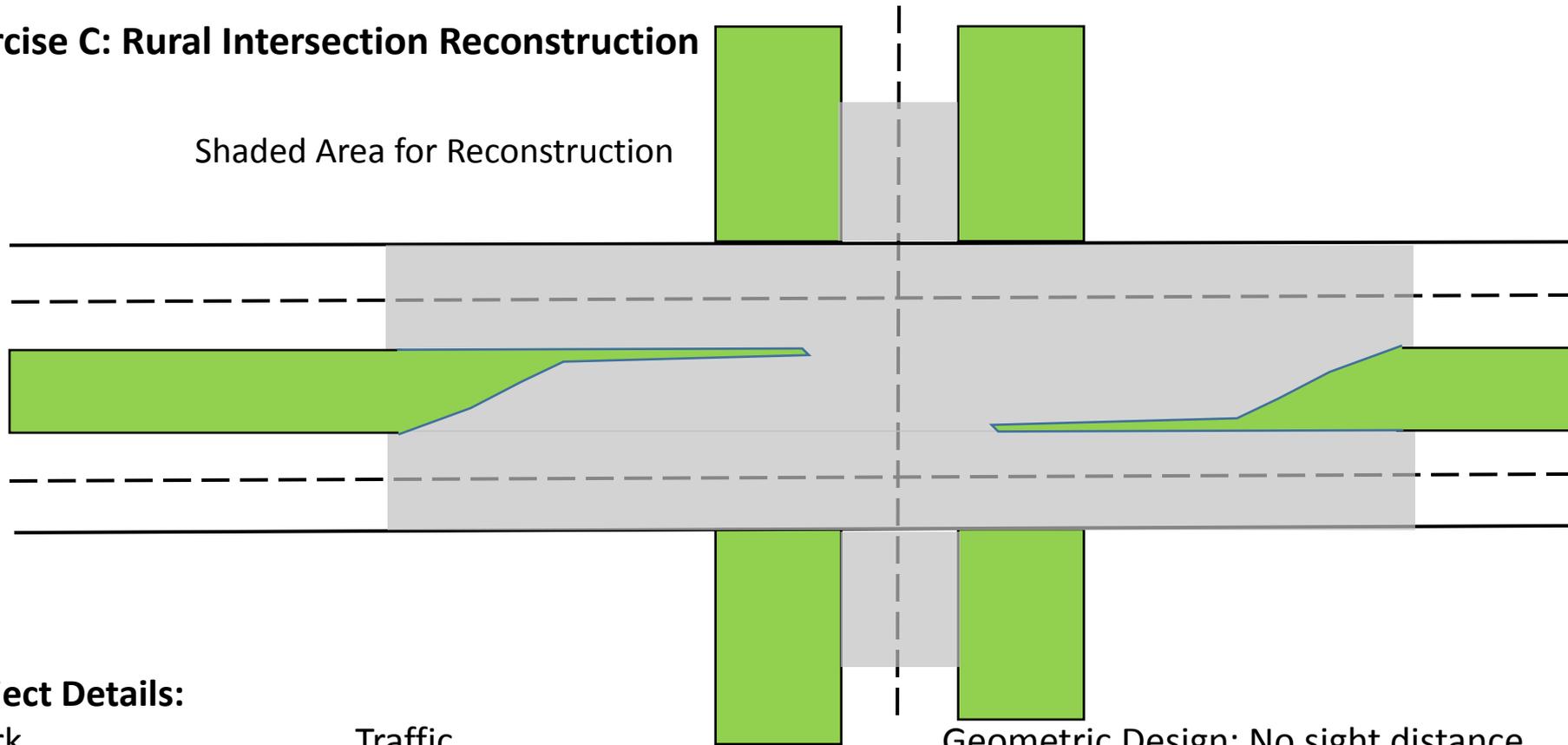
Geometric Design: High speed freeway design

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

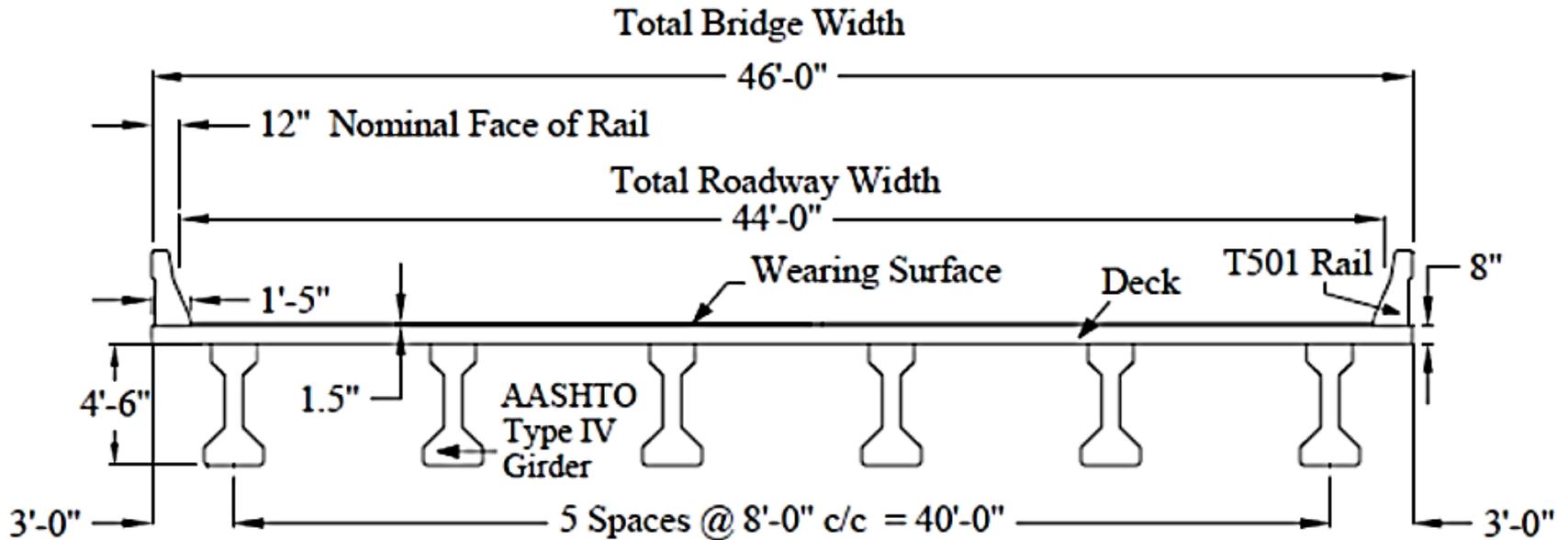
Geometric Design: No sight distance
problem

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



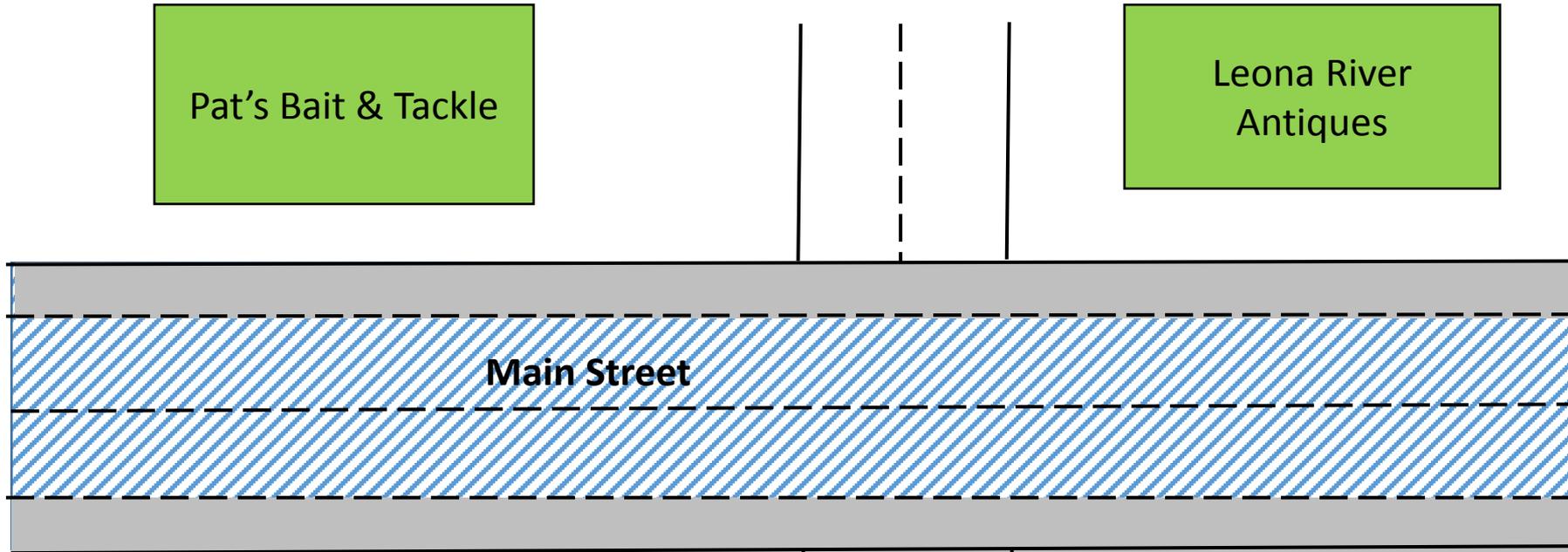
Project Details

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.)

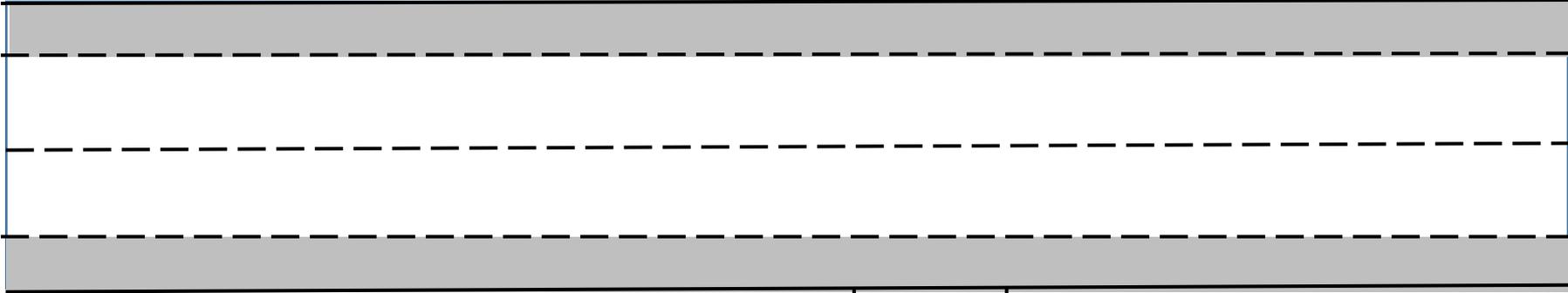
Geometric Design: Tangent section, 10 cross roads

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
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Economics: Approx. \$ 1M in user cost savings
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construction schedule

Utilities: Not an issue

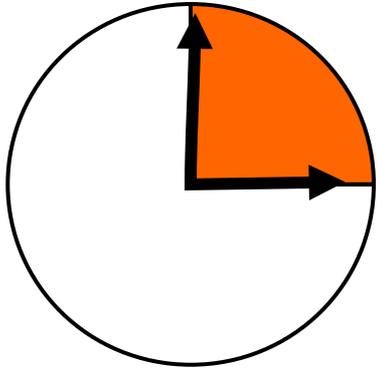
Items to Consider



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

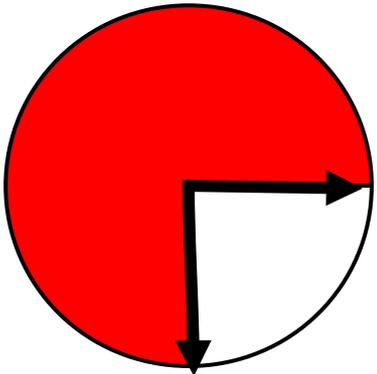


Suggested Time Utilization



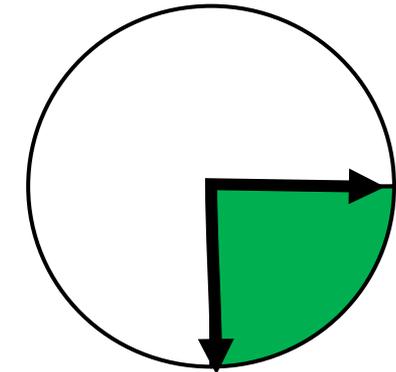
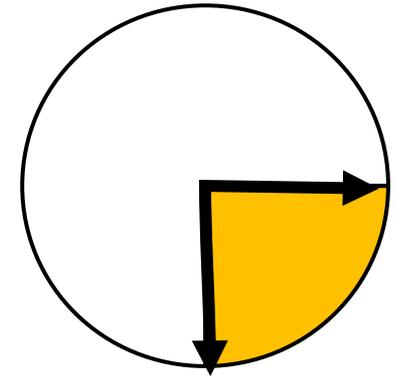
- General project discussion – 15 min

- Items to consider – 15 min



- Top five challenges – 45 min

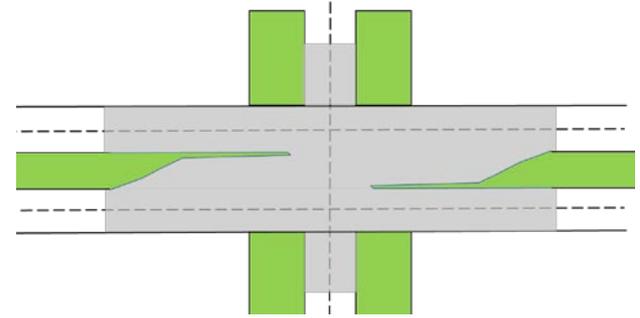
- Information needs – 15 min



Facilitator Report



- Briefly describe project
- Top 5 challenges
- Information needs



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



District Workshops on Accelerated Construction

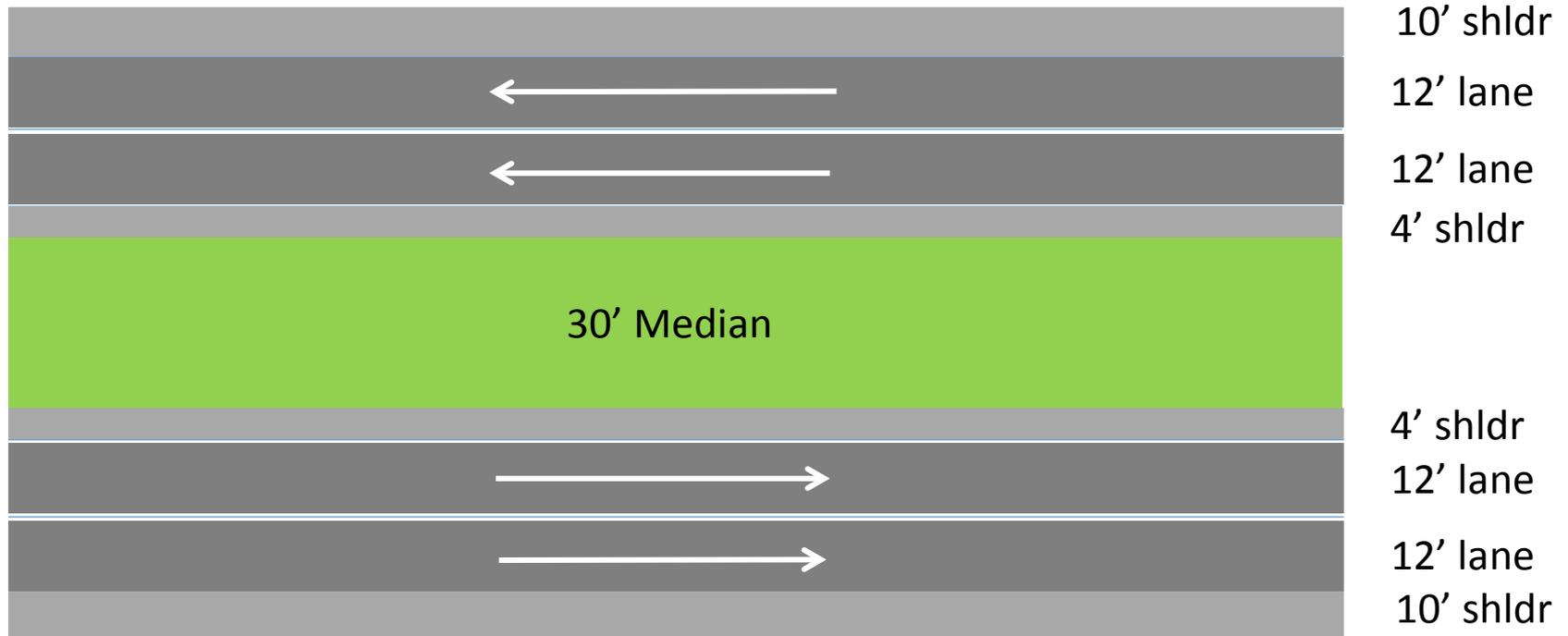


Lubbock

MCM Elegante Hotel and Suites
November 8, 2017



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- 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 weekends, ramps @ 1 mi. interval

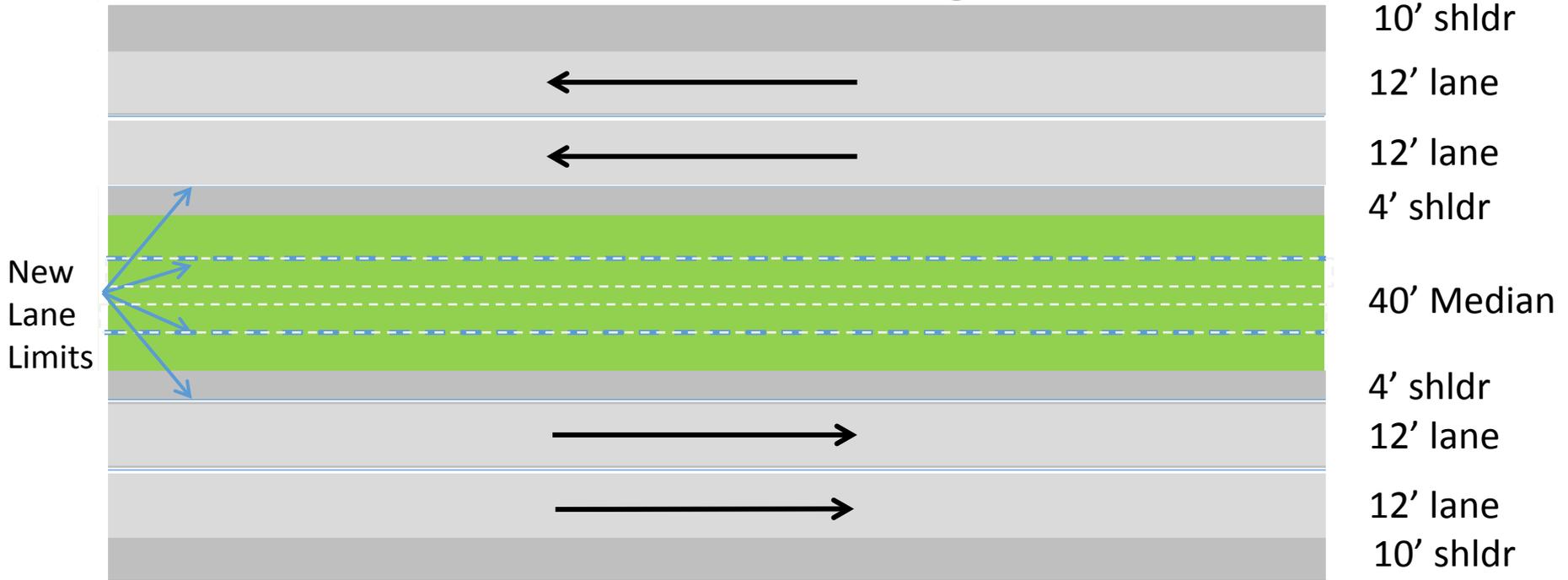
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Weekend heavy not congested

Possible Detours:

Frontage road requires strengthening, ramps @ 1.5 mi. interval

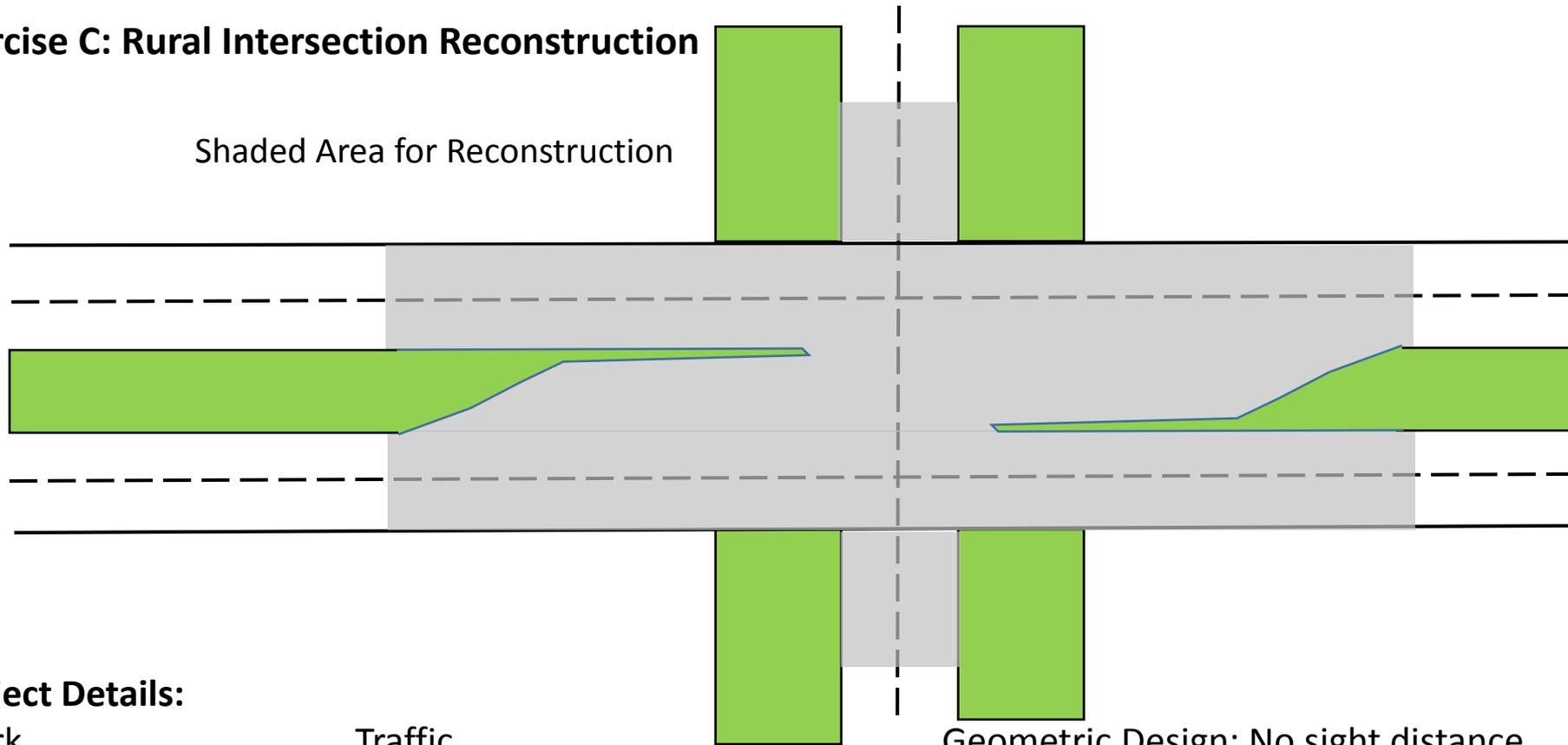
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Weekend heavy traffic to
recreational lake on 2-lane
roadway
Possible Detours: Result in
additional 15 miles

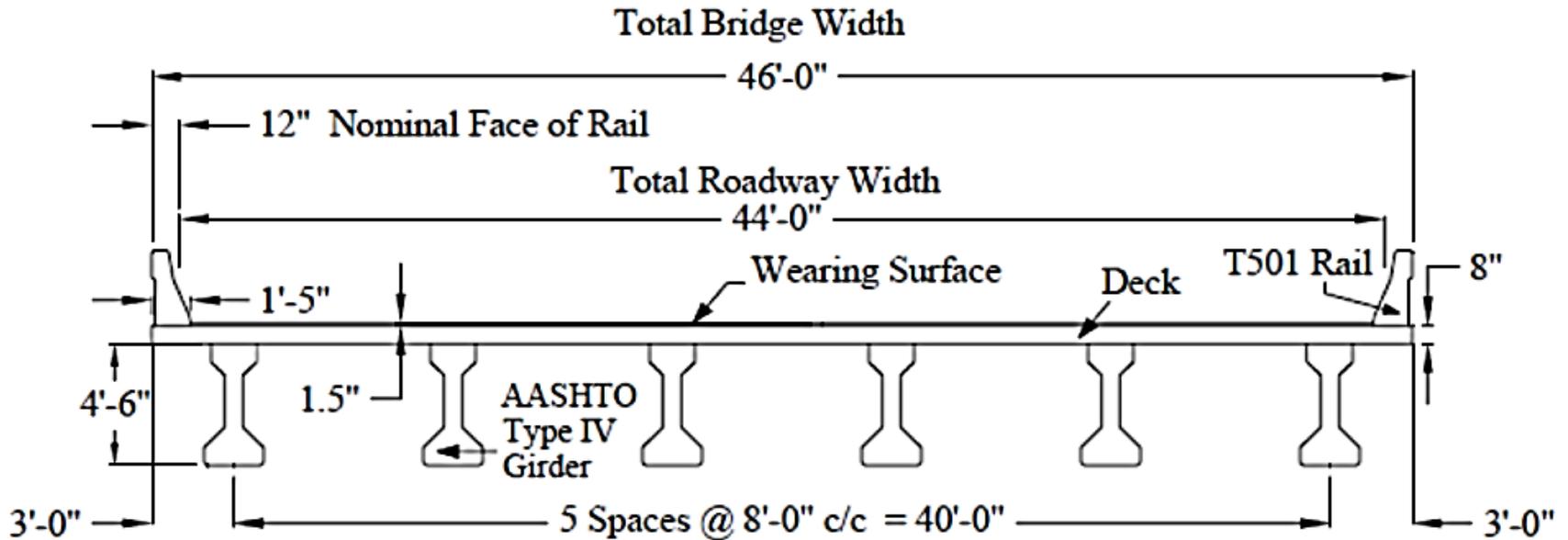
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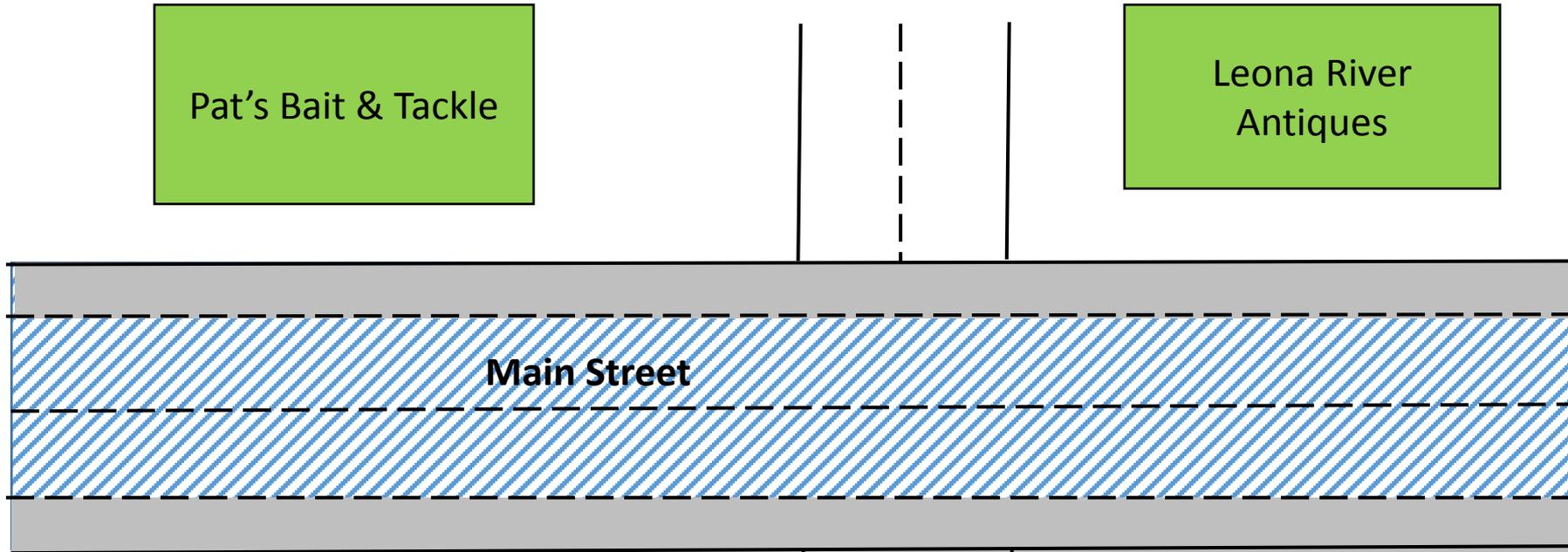
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- Traffic - AADT = 15,000
Peak M-F
6:30 am – 9:00 am
4:00 am - 7:00 pm
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Exercise E: Small Town Main Street



Project Details:

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 6' Shldr. Widening

 2" Overlay

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Traffic

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Possible Detours: side streets. Businesses on Main Street affected (20,000 sq. ft.)

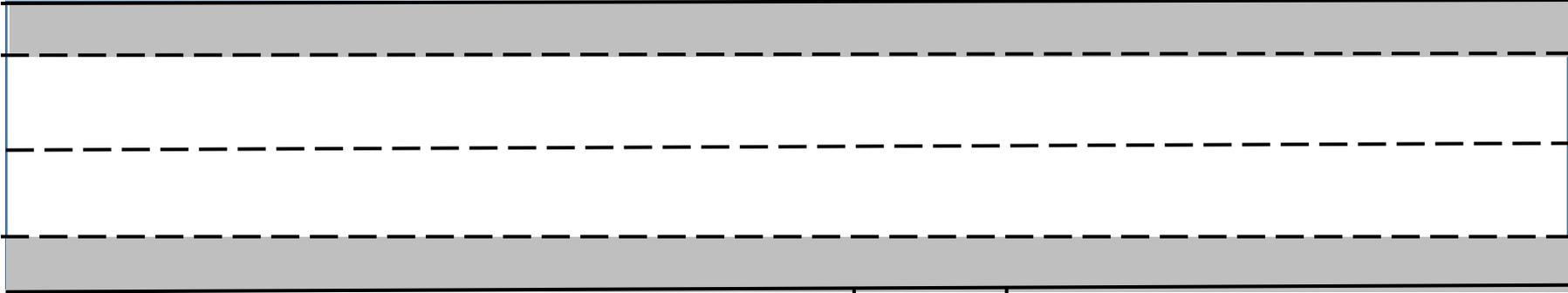
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Utilities: Not an issue

District Workshops on Accelerated Construction Workshop Summary

AC-PP-17-14
Jon Epps

Lubbock

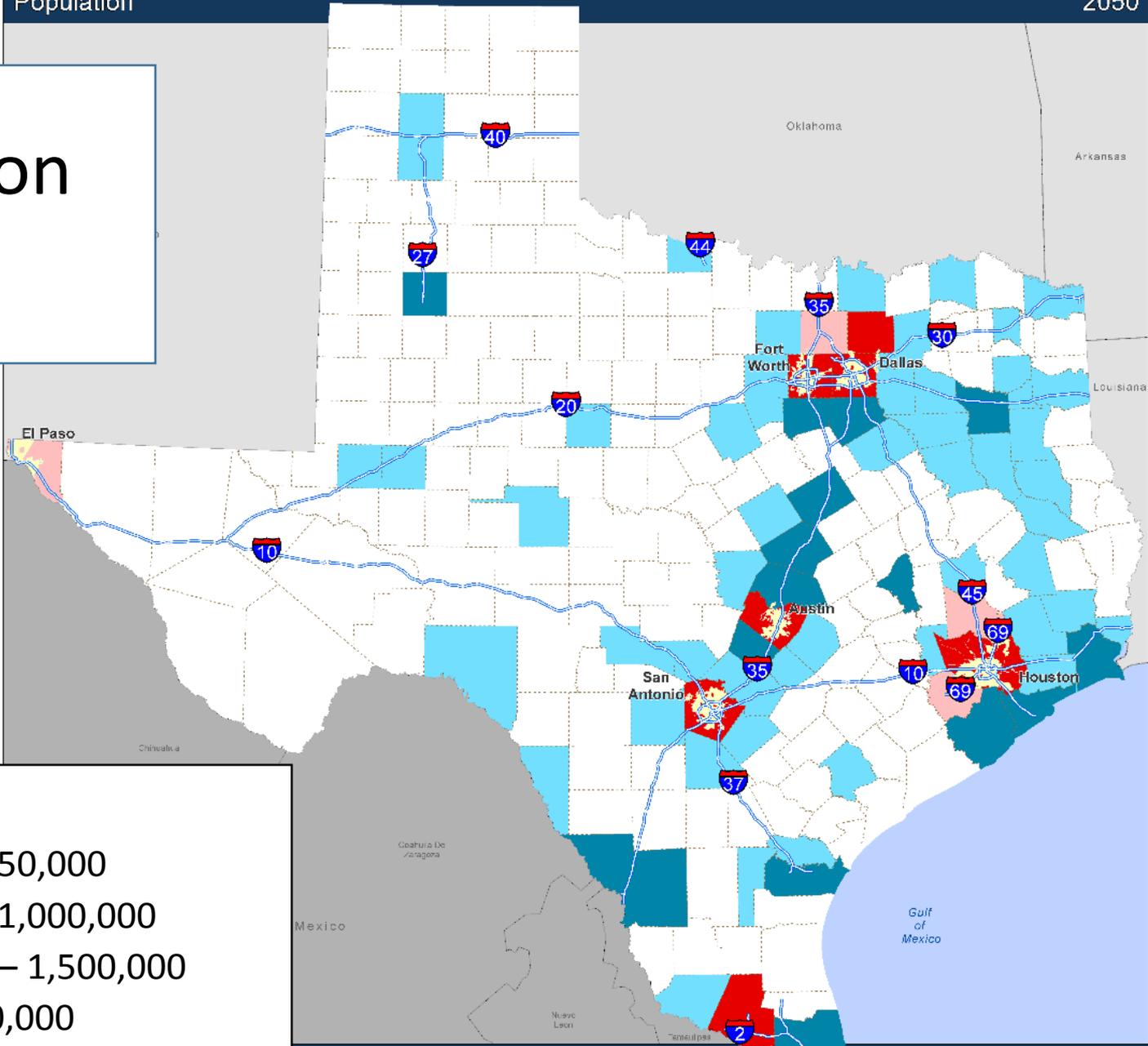
MCM Elegante Hotel and Suites

November 8, 2017

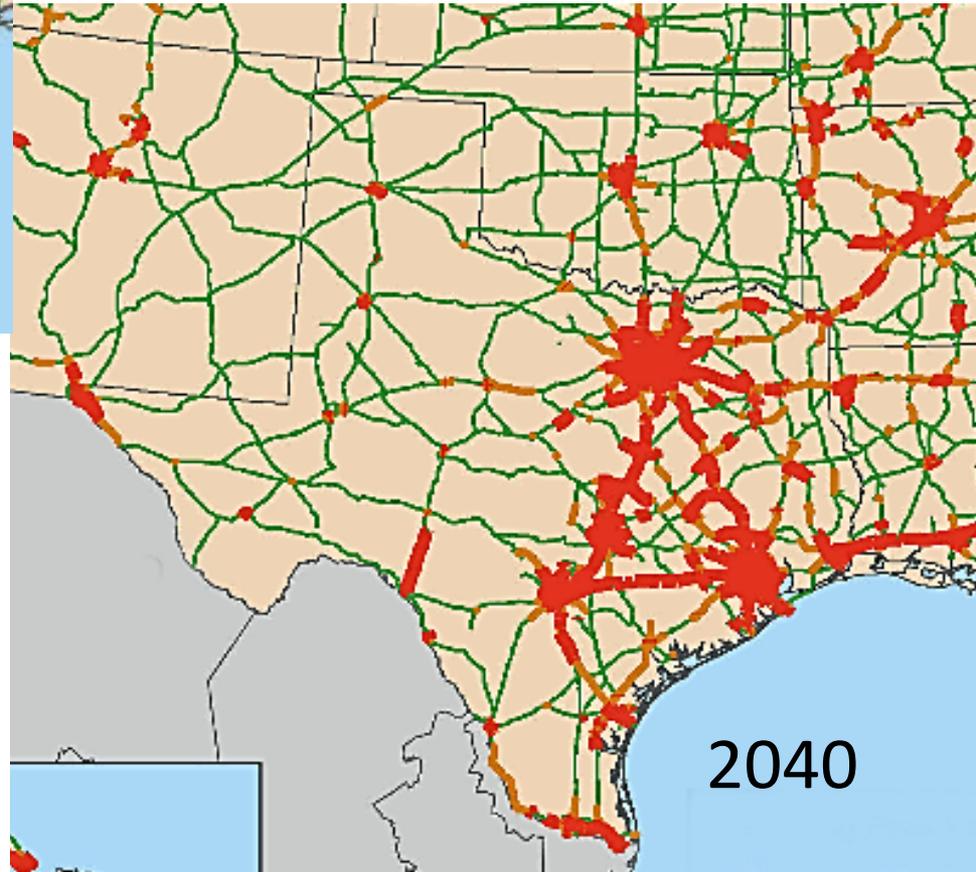
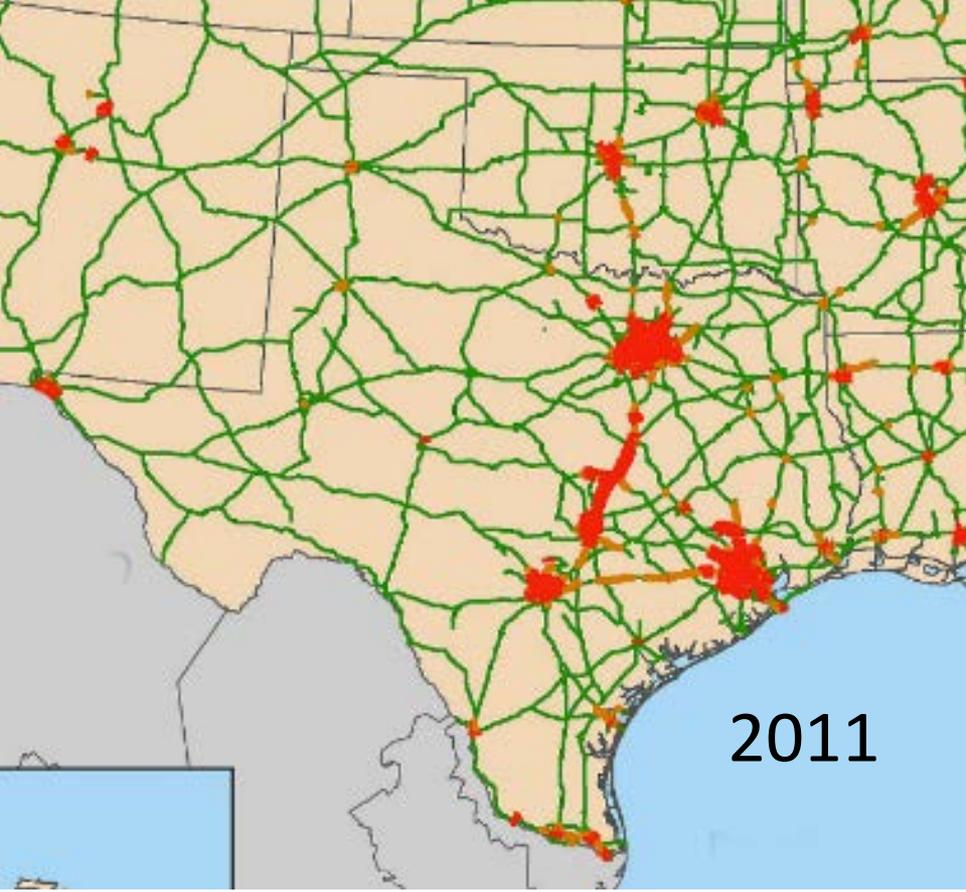
www.txdot.gov/business/resources/construction/regional-workshops.html



Population 2050



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

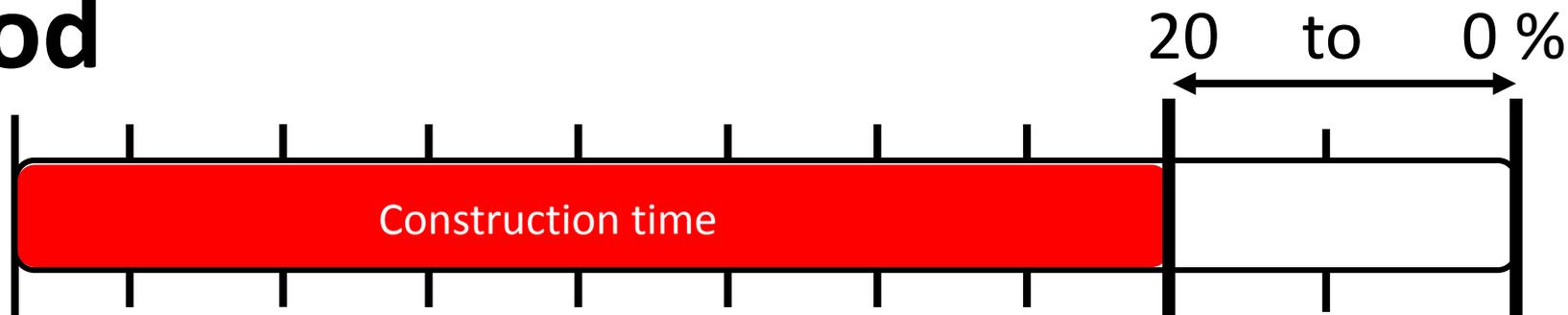
- Visibility to public
- Safety
- Economics



Acceleration Goals

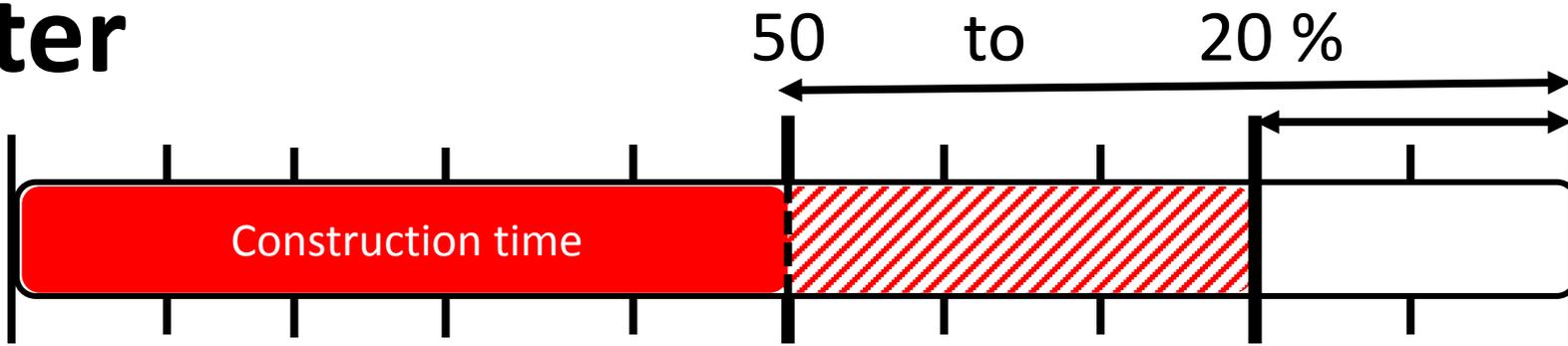


Good



reduction in time to complete project

Better



Economic Consideration

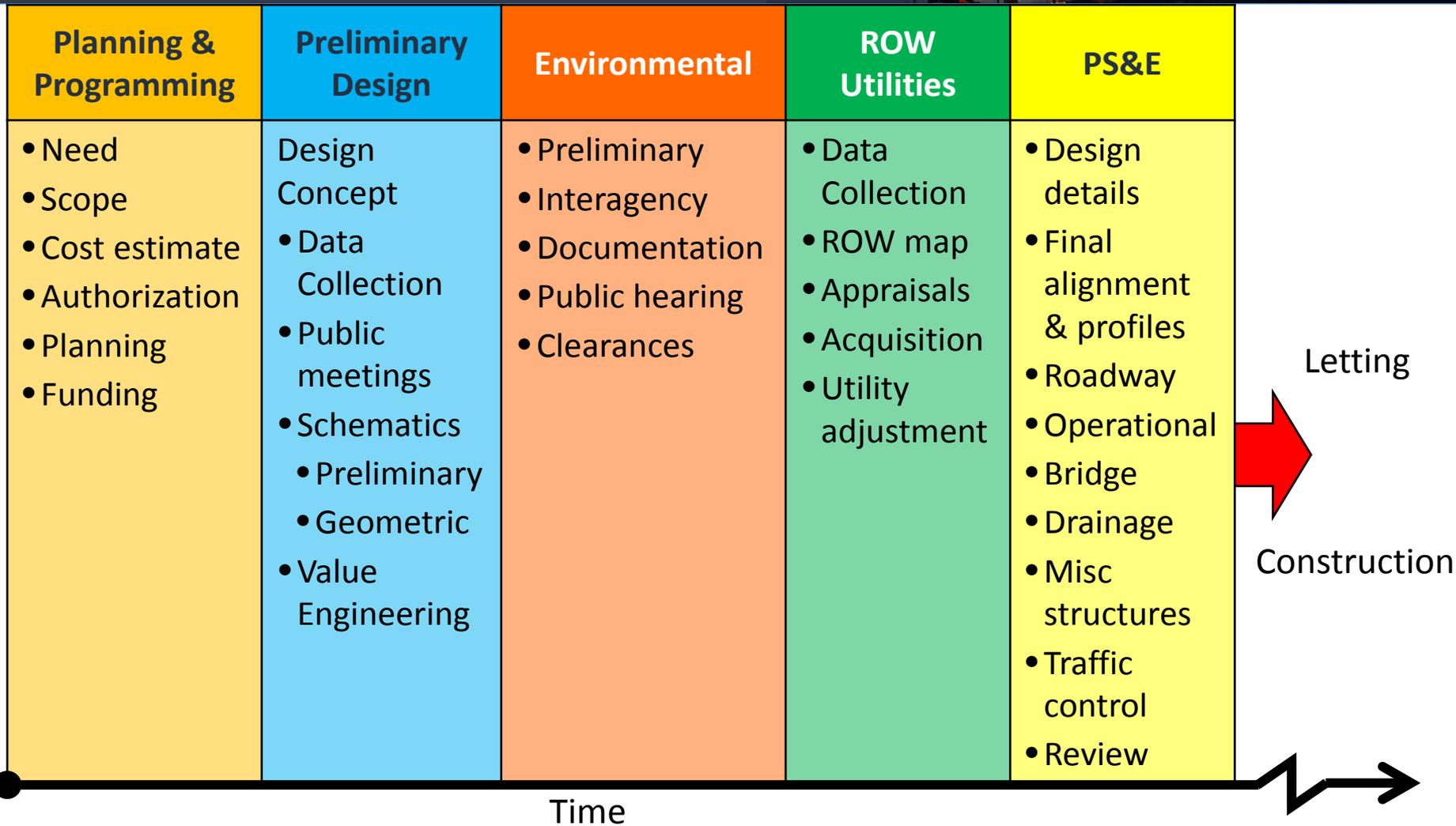


- Direct project costs
 - Agency
 - Some contractor
- Indirect project costs (user/non-user)
 - User fuel/time
 - Roadside businesses
 - Business efficiency (timely delivery)
 - Some Contractor

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

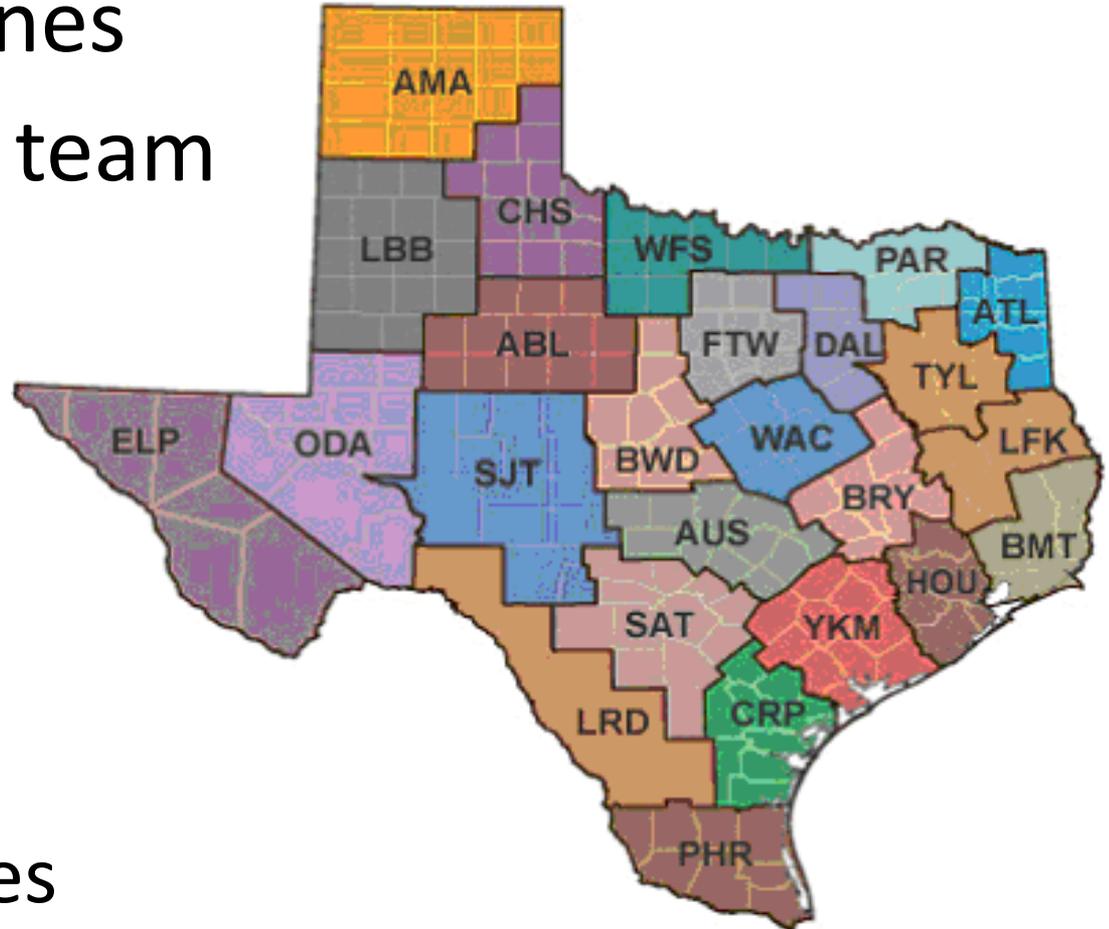
- One job/occasional job
- Return on investment (equipment)
- Bonding capacity
- Backlog of work
- Risk



Policies and Procedures



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



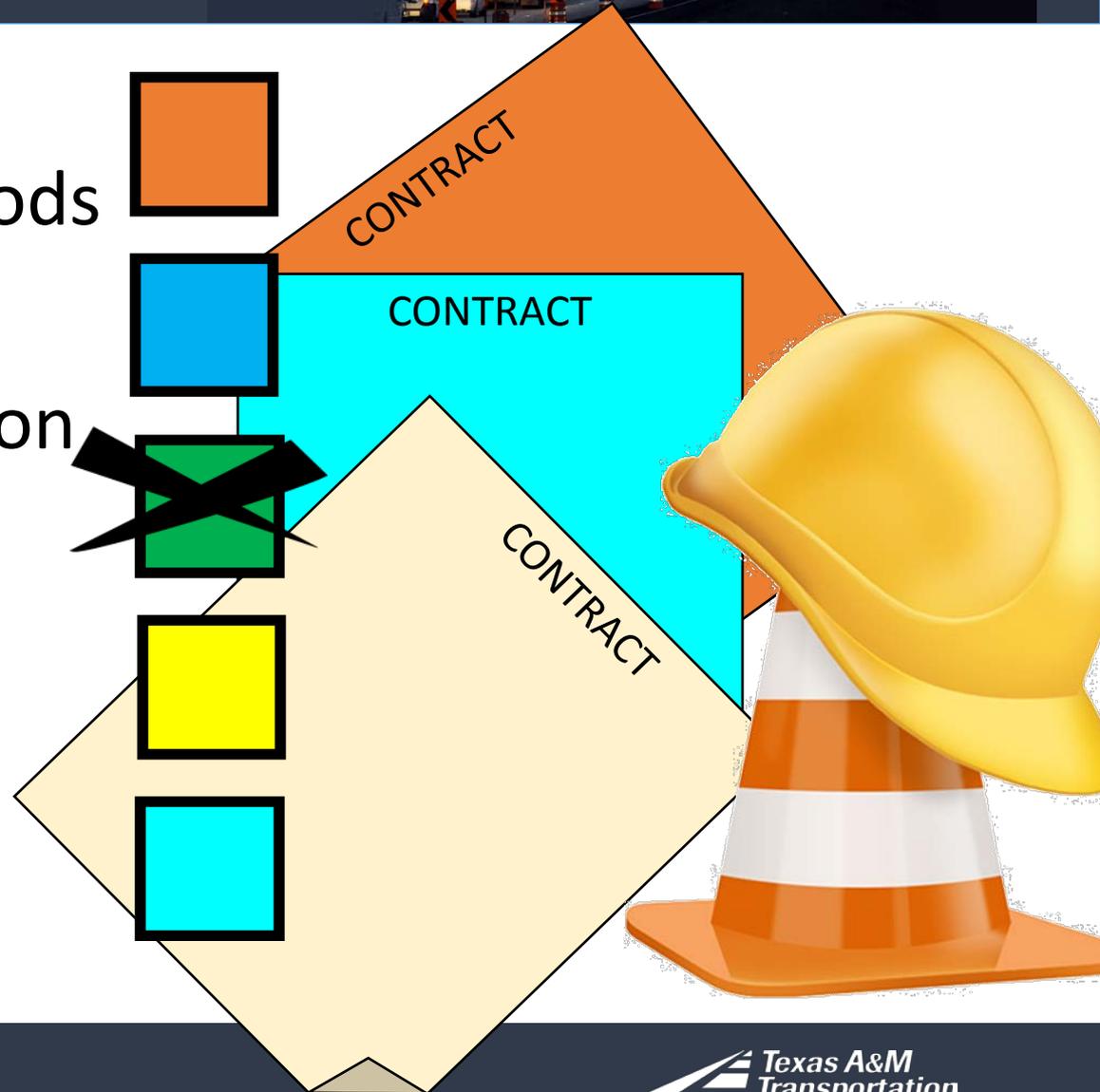
Involvement of Contractor

- Planning and design review
- Partnering
- Communication
- Workforce



Development Needs

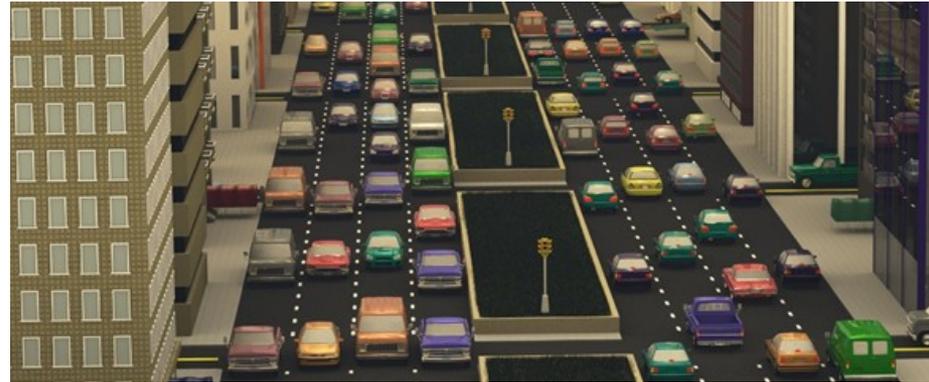
- Project selection
- Contracting methods
- Design guides
- Contractor selection
- Involvement of contractor
- Construction considerations



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**



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Stay IN



Get OUT

Stay OUT

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District Workshops on Accelerated Construction



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