

Dallas/Fort Worth/Waco: District Workshop on Accelerated Construction
June 13, 2017
Westin DFW

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 in U.S.	David Newcomb - TTI
9:00-9:30	TxDOT's Interest	Randy Hopmann - TxDOT, ADM
9:30-9:50	Project Selection Based on Economics	David Ellis - TTI
9:50-10:10		Break
10:10-10:40	Project Development	Tracy Cain - TxDOT, CST
10:40-11:00	Accelerated Bridge Construction in Texas	Graham Bettis - TxDOT, BRG Prapti Sharma - TxDOT, FTW Ray Fisher - TxDOT, DAL
11:00-11:20	Design Considerations with Examples of Past Success	Lacey Rodgers - TxDOT, DAL
11:20-11:30	Traffic and Safety	Ceason Clemens - TxDOT, DAL
11:30-11:40	Public Information	Tony Hartzel - TxDOT, DAL
11:40-12:00	Accelerated Construction Concepts	Phillippe Falkner - Ed Bell Construction Company
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-Widening Bridge • E-Small Town Intersection • F-Suburban/Rural Widening 	David Newcomb - TTI <i>Facilitators:</i> A-Chad Dabbs - TxDOT, FTW B1-Darwin Myers - TxDOT, DAL B2-Etienne Etchouekang - TxDOT, DAL C-Jason Mashell - TxDOT, DAL D-Charles Smith - TxDOT, WAC E-Jason Duncan - TxDOT, WAC F-Korey Coburn - TxDOT, FTW <i>Reporters:</i> A-Brandon Sparkman - TxDOT, DAL B1-Christian Mendoza - TxDOT, FTW B2-Tina Massey - TxDOT, DAL C-Solomon Thomas - TxDOT, WAC D-Brenan Honey - TxDOT, DAL E-Jeff Bush - TxDOT, DAL F-Justin Thomey - TxDOT, FTW
1:00-2:30	Facilitated Discussion	Group Leaders - TxDOT
2:30-3:15	Report from Breakout Groups & Discussion	David Newcomb - TTI
3:15-3:30		Break
3:30-3:45	Looking to the Future - Contractor	Phillippe Falkner - Ed Bell Construction Company
3:45-4:15	Looking to the Future - TxDOT	Randy Hopmann - TxDOT, ADM
4:15-4:30	Summary and Adjourn	Jon Epps - TTI

District Workshops on Accelerated Construction

Welcome
AC-PP-17-01
Jon Epps

Dallas/Fort Worth/Waco

Westin DFW

June 13, 2017



Safety Information

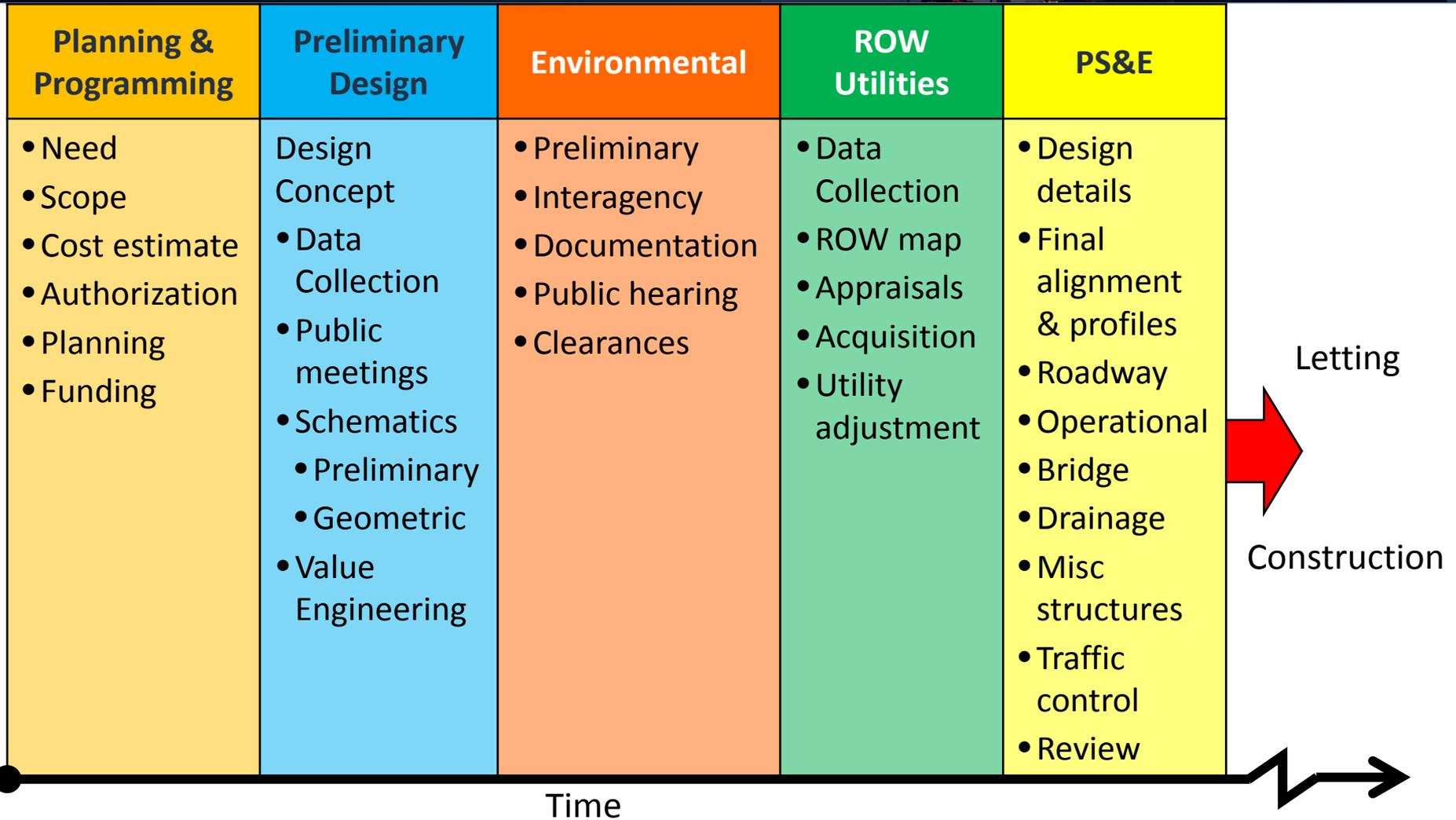


Accelerated Construction

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



Project Delivery



Definition of Construction

Greenfield

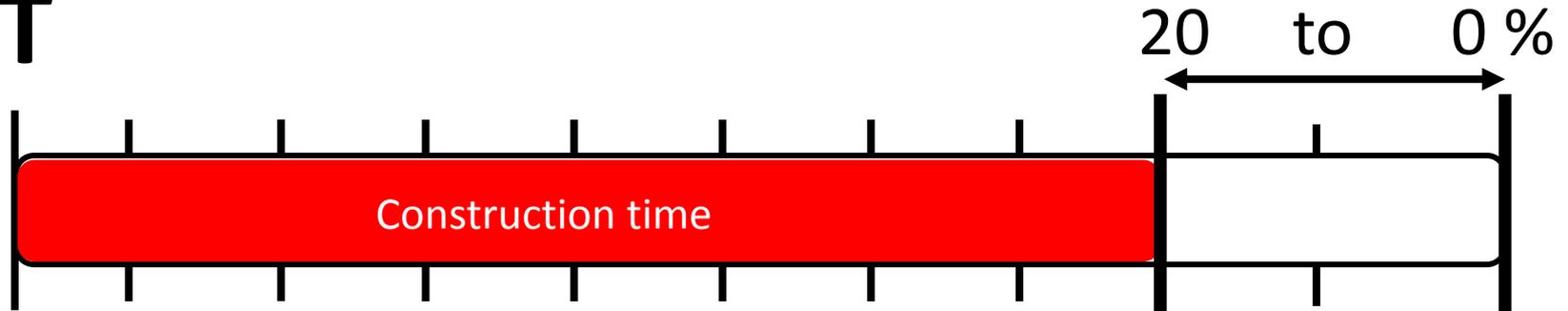
- Capacity improvement
- Reconstruction
- Rehabilitation
- Major maintenance
- Minor maintenance



Acceleration Goals

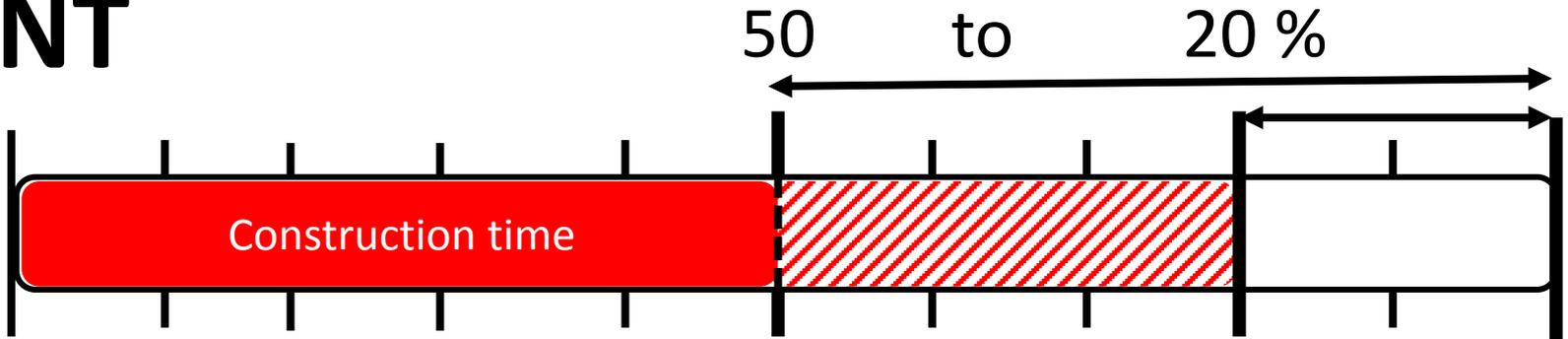


NOT



reduction in time to complete project

WANT





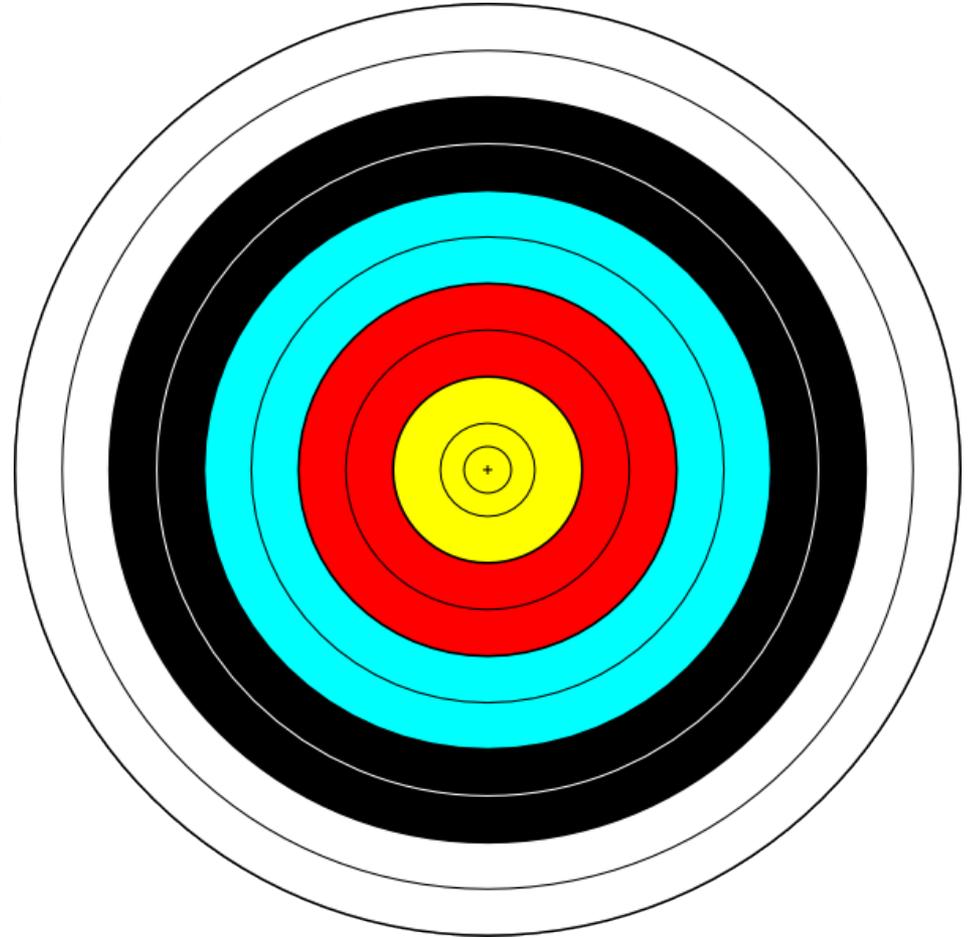
CAUTION

Not All Projects Are
Suitable for
Accelerated Construction

Workshop Goals



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



Agenda



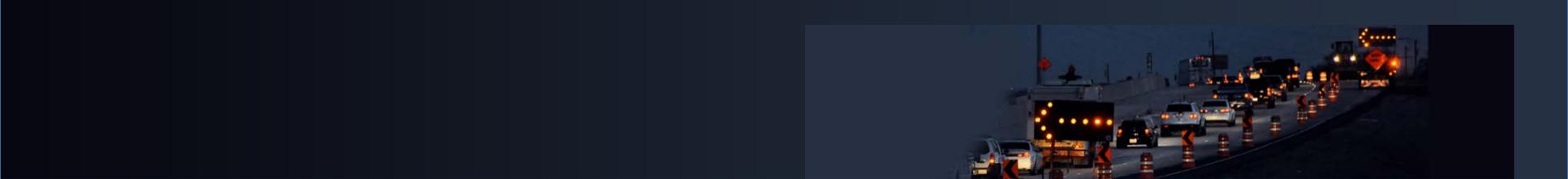
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8:30-8:45	Welcome	Epps
8:45-9:00	History of Accelerated Construction	Newcomb
9:00-9:30	TxDOT's Interest	Hopmann/Cain
9:30-9:50	Project Selection Economics	Glover/Ellis/Newcomb/Epps
9:50-10:10	BREAK	TBD
10:10-10:40	Project Development	Cain
10:40-11:00	Accelerated Bridge Construction	Division/District
11:00-11:20	Design Considerations	Local Dist. Rep.
11:20-11:30	Traffic/Safety	Local Dist. Rep.
11:30-11:40	Public Information	Local Dist. Rep
11:40-12:00	Construction	Local Contractor
12:00-12:45	LUNCH	

Agenda



Time	Topic	Facilitator
12:45-1:00	Charge to Groups	Newcomb
1:00-2:30	Group Discussion of Example Problems	Group Leaders/Recorders
2:30-3:15	Reports from Groups	Group Recorders
3:15-3:30	BREAK	
3:30-3:45	Contractor's View of the Future	TBD
3:45-4:15	TxDOT's View of the Future	Hopmann/Cain
4:15-4:30	Summary/Adjourn	Epps

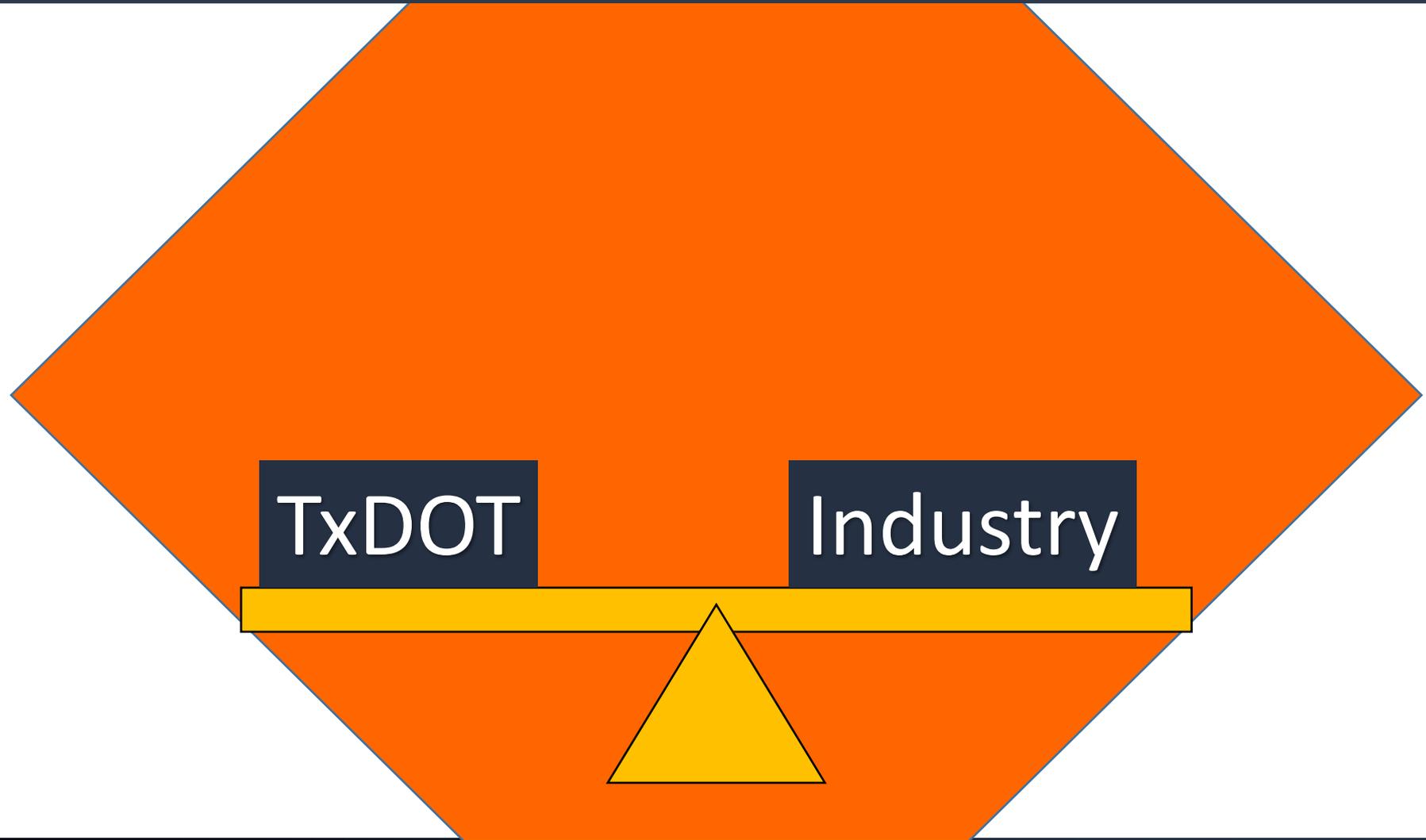




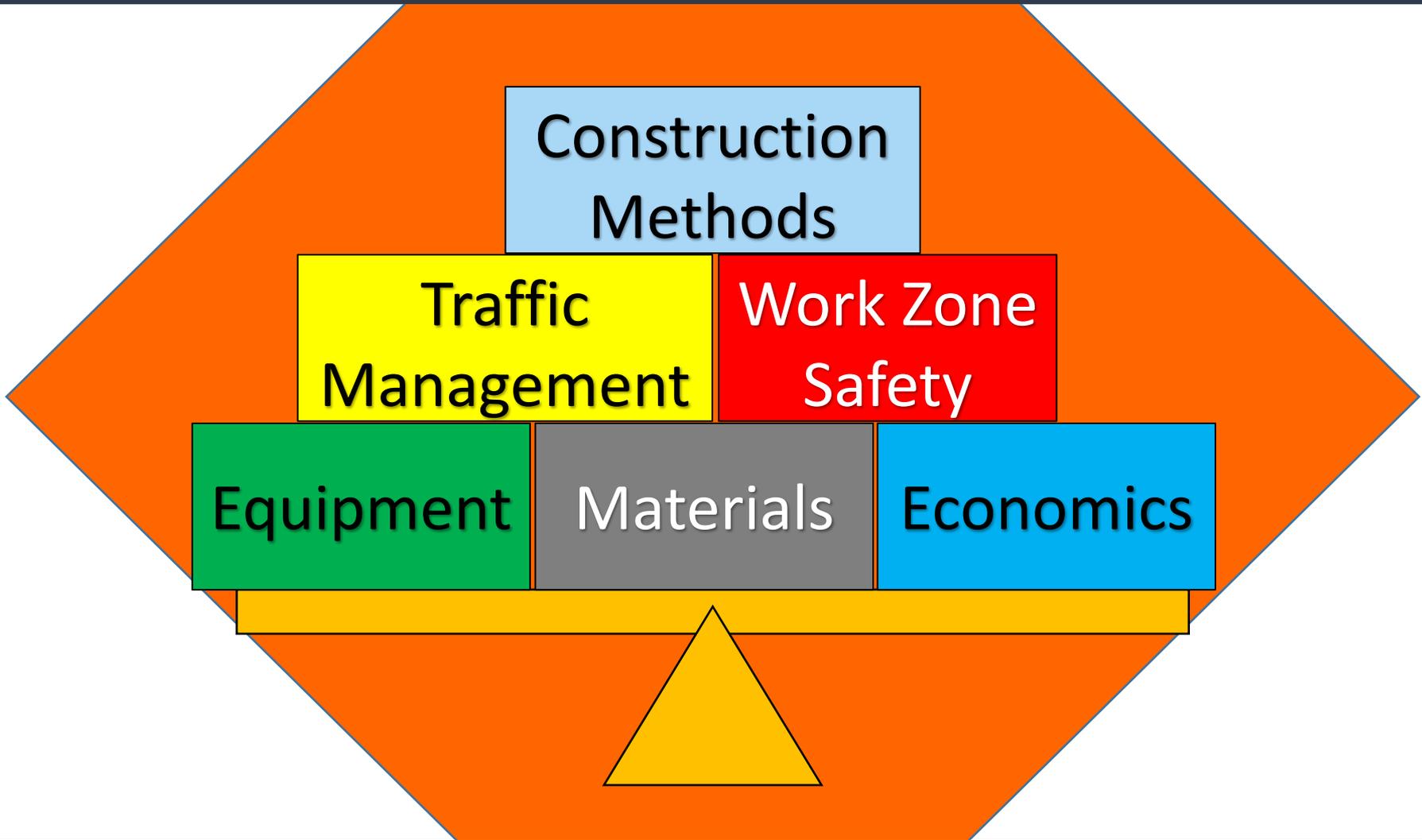
ACCELERATED CONSTRUCTION DOCUMENTS

- Briefs
- Implementation Reports
- Presentations

Accelerated Construction



Accelerated Construction



Introductions





District Workshops on Accelerated Construction

District Workshops on Accelerated Construction

US History

AC-PP-17-02

David Newcomb

Dallas/Fort Worth/Waco

Westin DFW

June 13, 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)



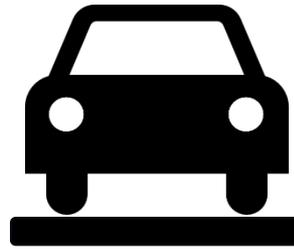
1990's – 2000's Driving Forces

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%



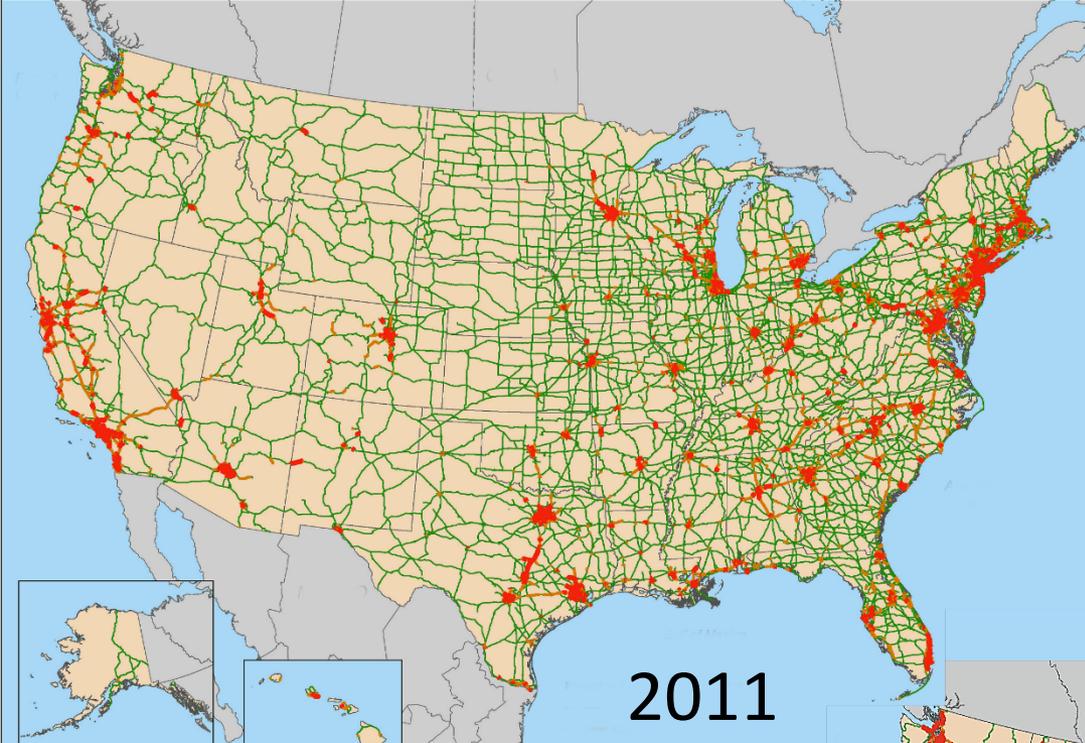
+3.8%



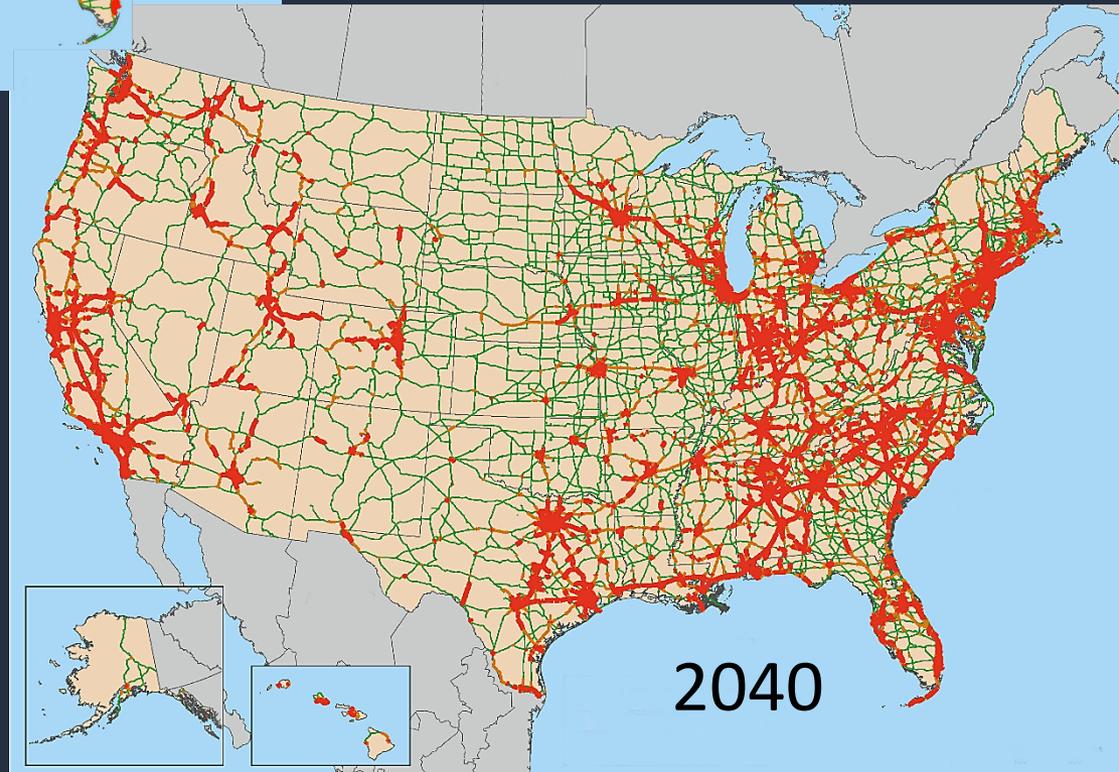
Accelerated Construction Skill Sets

<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

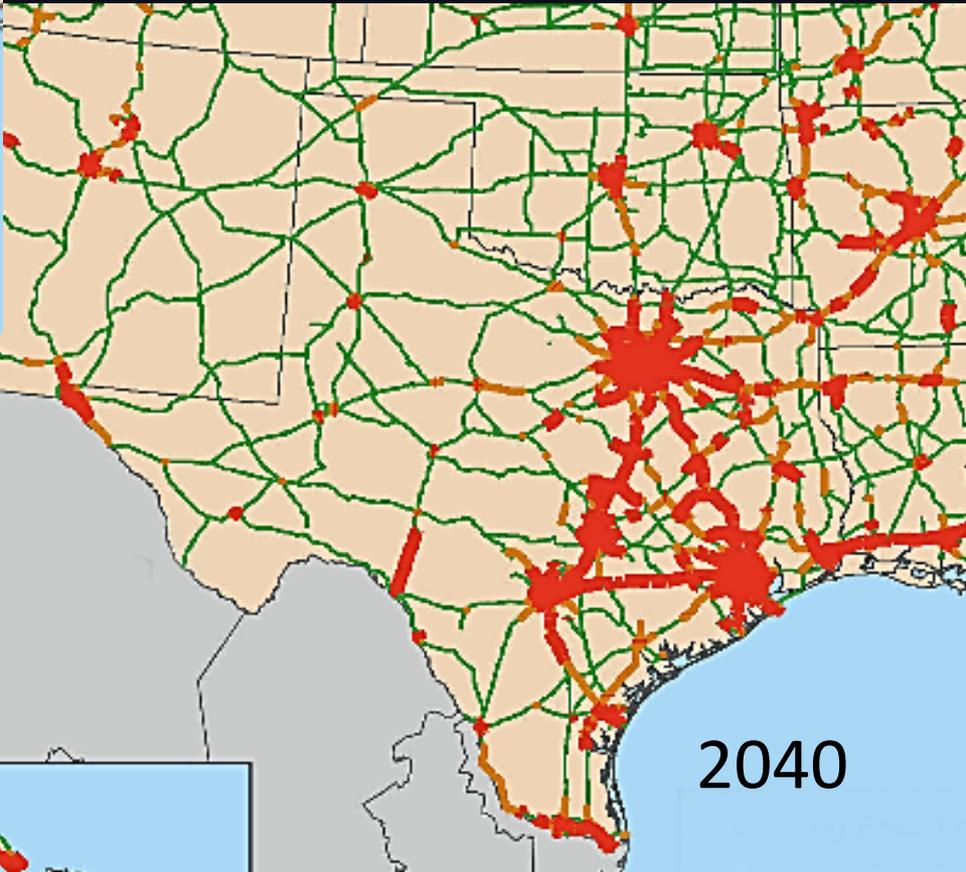
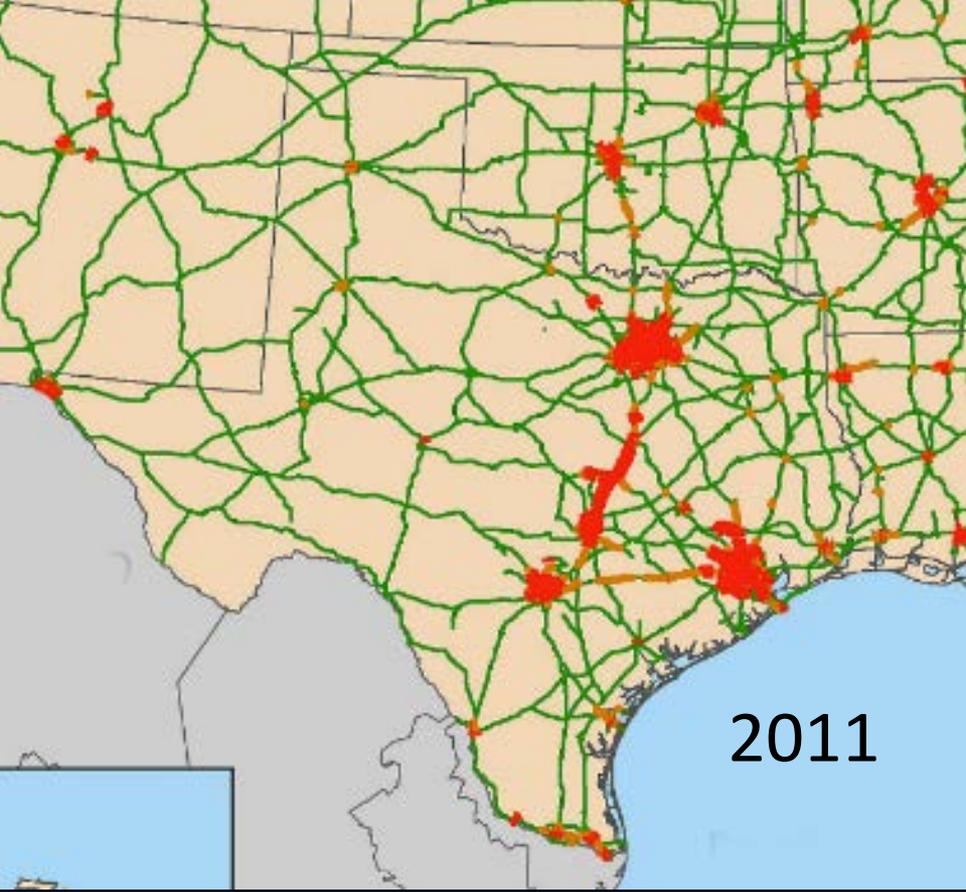


2040

Recurring Peak-Period Congestion

-  Uncongested
-  Congested
-  Highly Congested

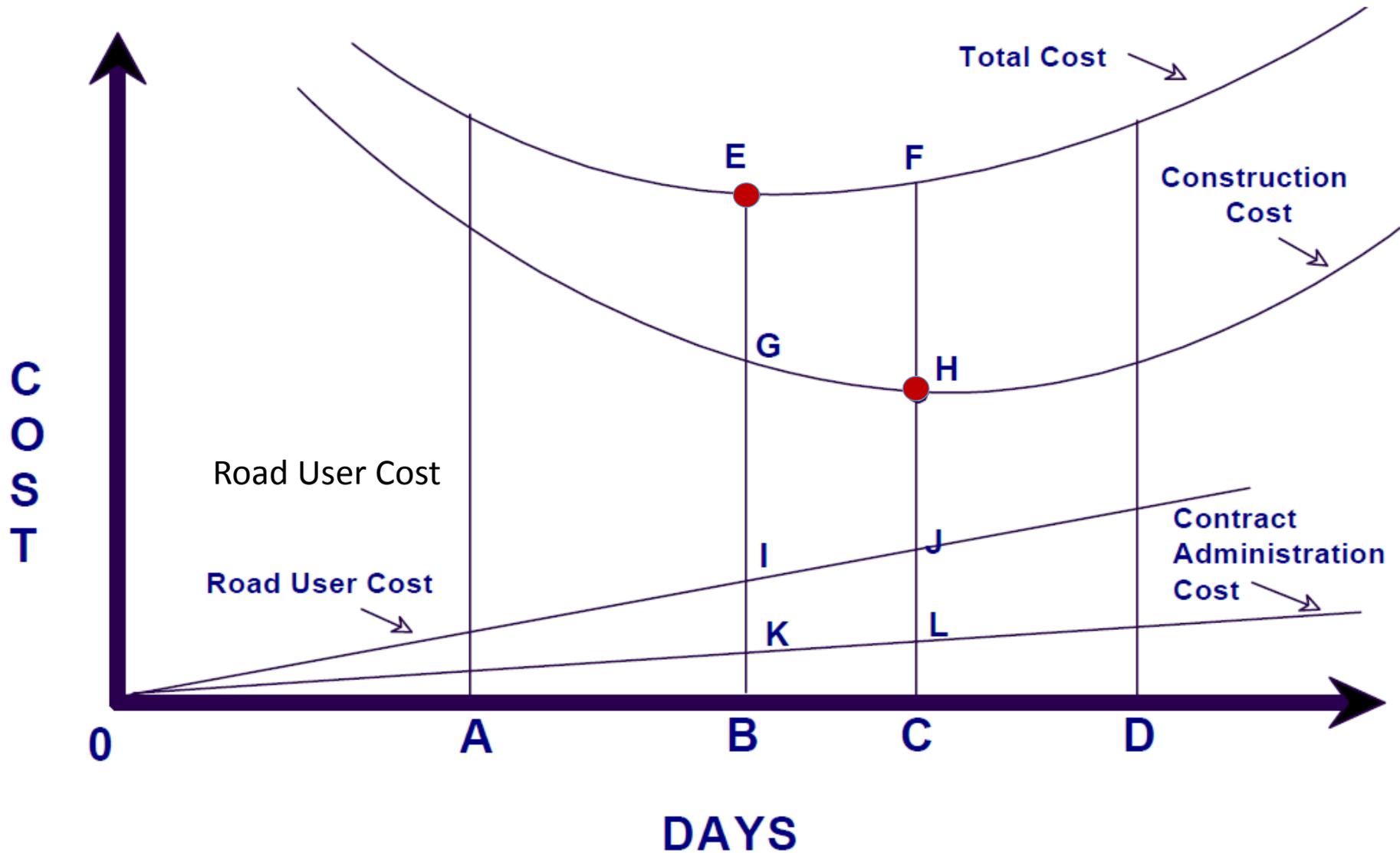
Peak-Period Congestion on NHS



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

Portland, OR – I-284, 2002 (FHWA, 2003)

- 33 lane-miles of asphalt paving
- AADT = 180,000 vpd (7% Commercial)
- Project dates: Aug 2 – 12
- One 100-hour window
 - 5.5 miles of 6-lane road
 - 40,000 tons asphalt mix
- Total duration of project reduced 85%
- If night closures used, 32 nights required
- Project savings only about 2 percent
- ODOT reported improved safety for public and workers



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

Georgia I-85, (Anderson et al., 2006)

- Slab saw cuts at night
9 pm – 5 am
- Excavation & paving on weekends
- Preplanned equipment staging
- On-site batch plant
- Nearby disposal sites
- Quick-change moveable barrier
- Extensive public info
- Hour-by-hour monitoring of project and weather



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)

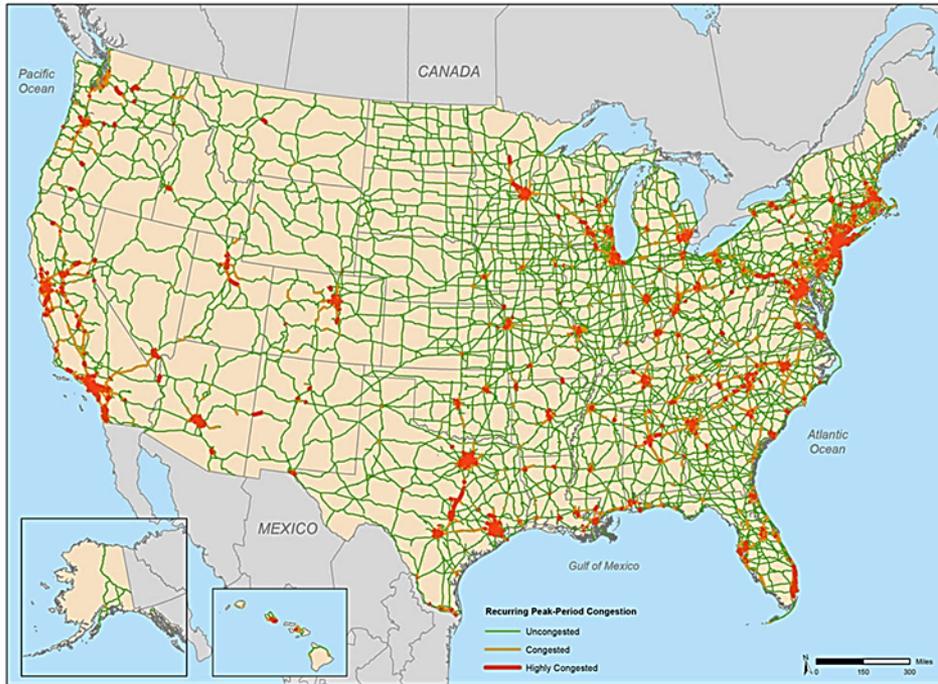
- Complex project involving utilities
- Prequalified bidders
- Req'd 12-hr days, 7 d/wk (14 on/2off)
- 3 milestones with up to \$120k bonus for each
- Penalty - \$20k/day
- Urban area – intersections on weekend, noise mitigation at night
- PR campaign was successful

Summary

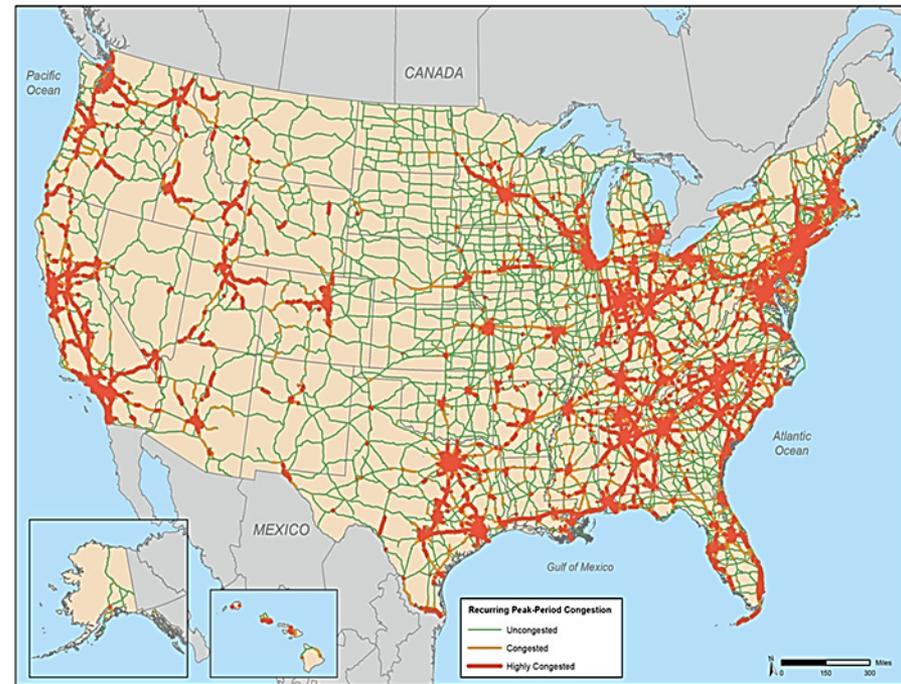


- Accelerated construction not new
- Requires
 - Right application
 - Incentives/disincentives
 - Recognition of and planning for risks
 - Flexibility on part of agency and contractor
 - Innovative thinking
 - Public engagement
- Will become more standard with time

Things Will Not Become Simpler!



(a) Year 2011



(b) Year 2040

TxDOT Interest in Accelerated Construction

AC-PP-17-03
Randy Hopmann

Dallas/Fort Worth/Waco

Westin DFW

June 13, 2017



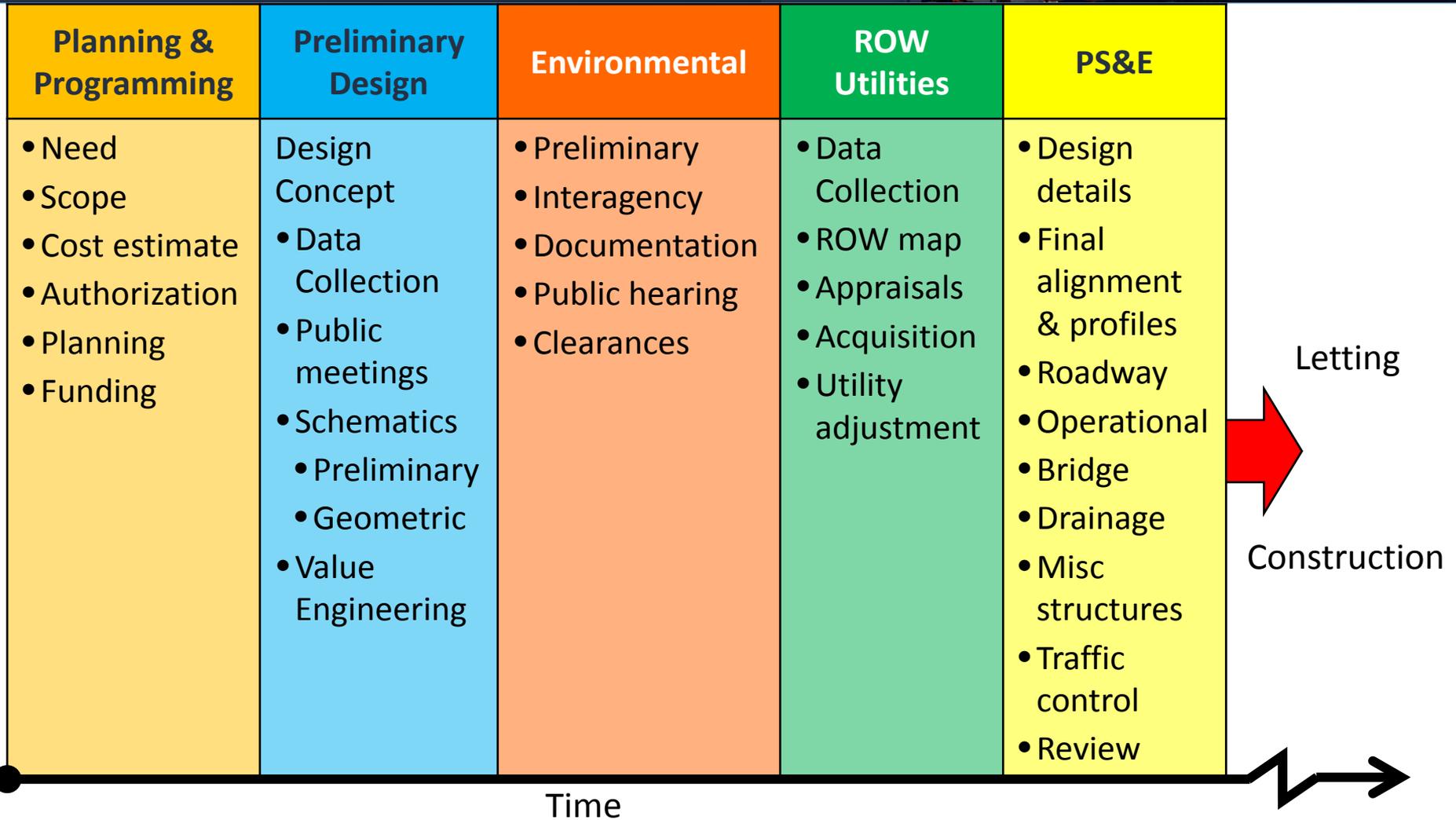
Outline



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



Project Delivery



Economic Considerations-Examples

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



Interest in Construction

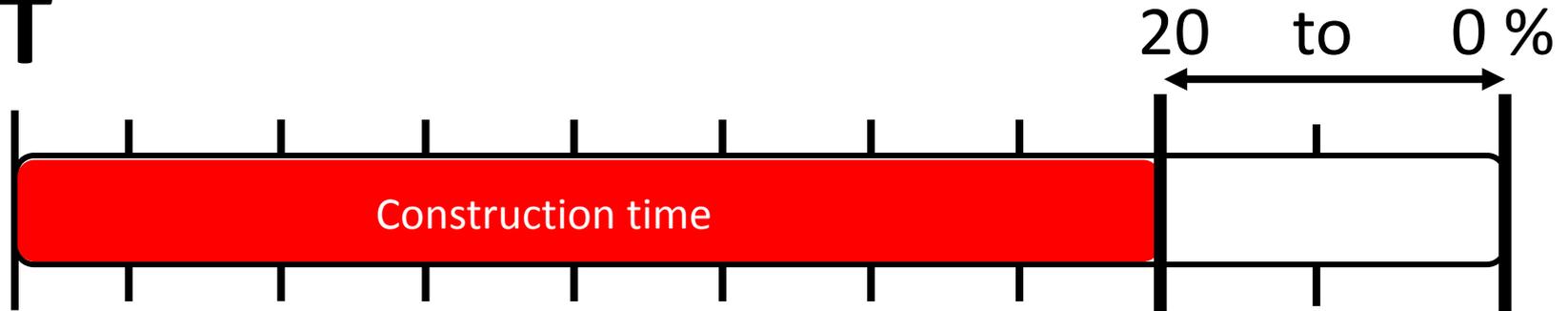
- Visibility to public
- Safety
- Economics



Acceleration Goals

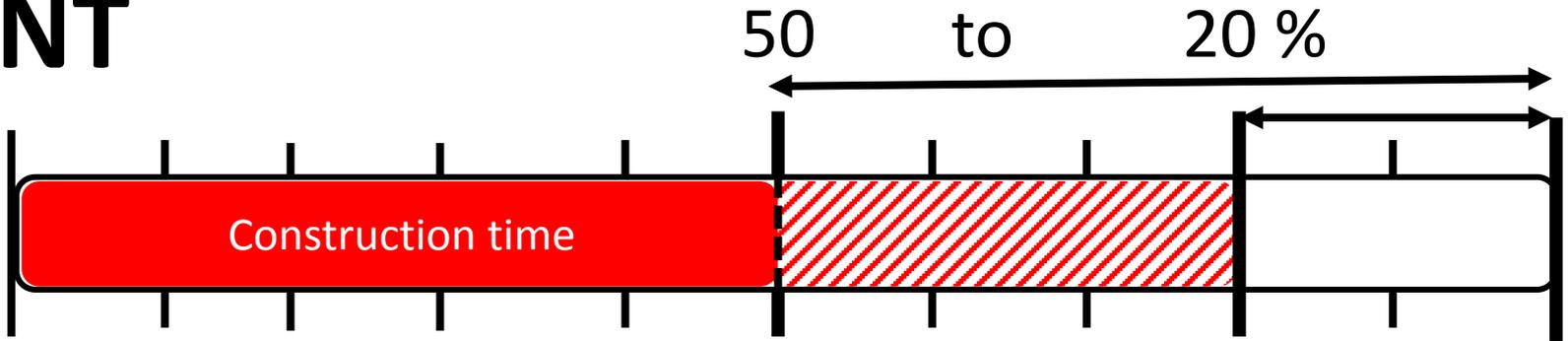


NOT



reduction in time to complete project

WANT



Economic Considerations - Stakeholders

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



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



Concept



- Reduce days/month
- Reduce time by 20 - 50 percent
- Examples
 - HMA overlay (30 days to 6 days)
 - Rehabilitation (9 months to 4 weekends)
 - Add lanes (18 months to 9 months)
 - Reconstruction (3.5 years to 1.8 years)



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



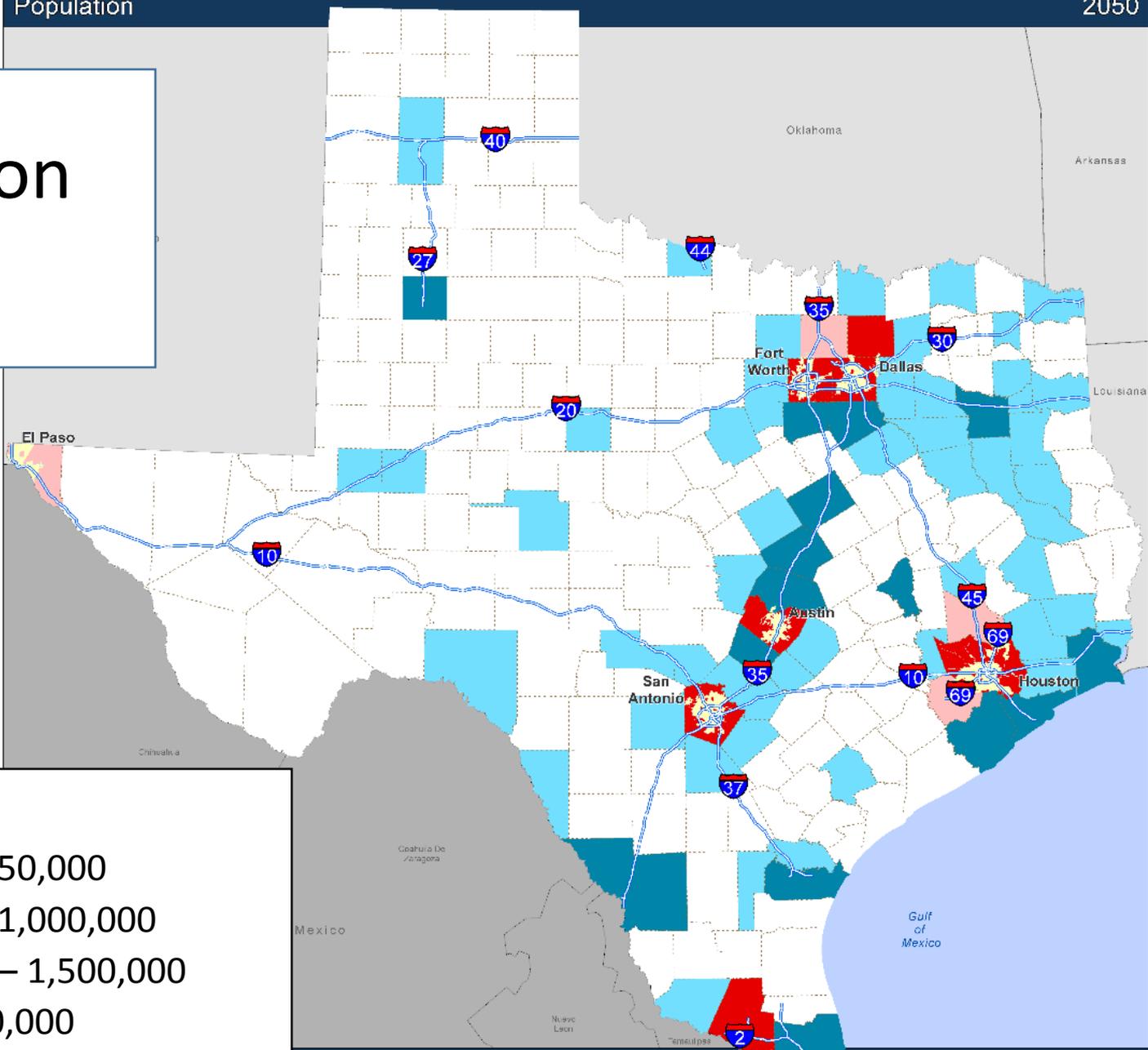
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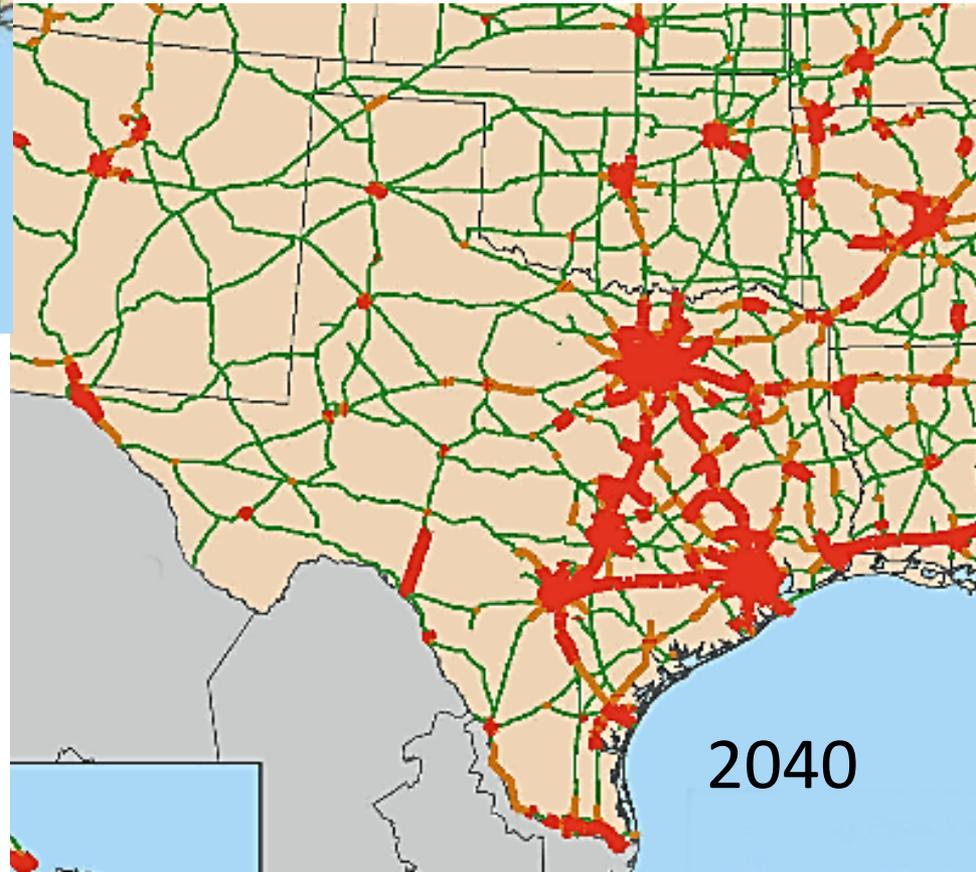
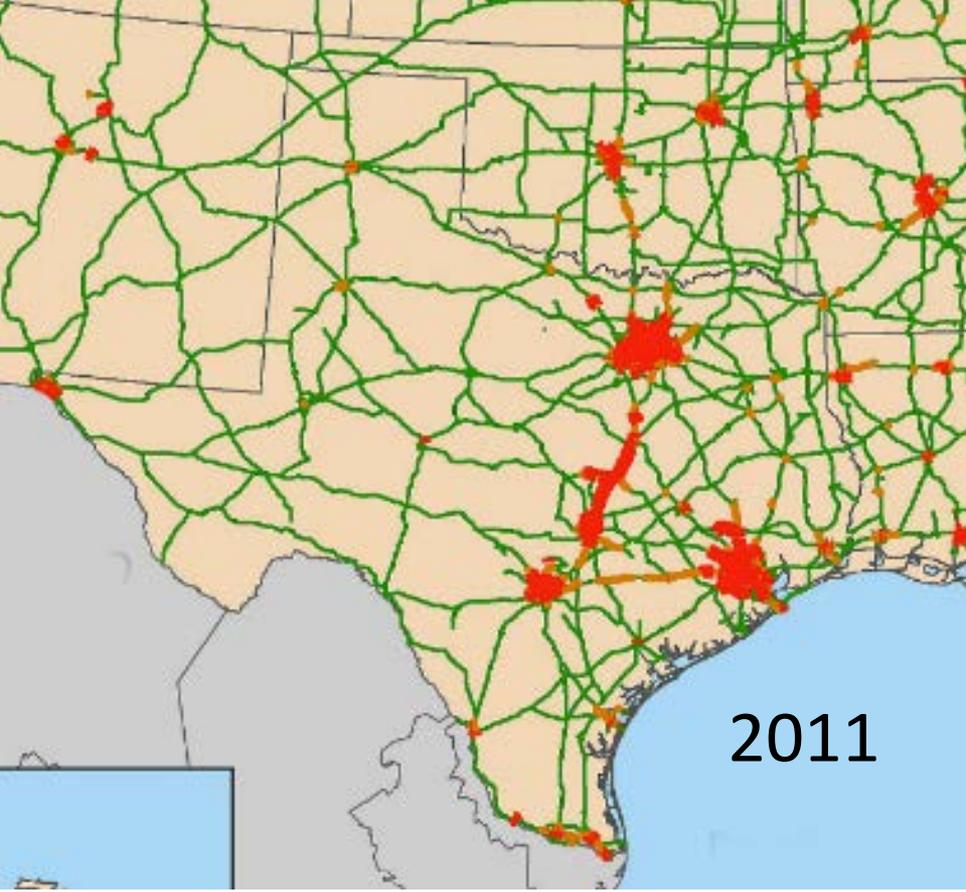


Population 2050



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

Peak-Period Congestion on NHS



Recurring Peak-Period Congestion

-  Uncongested
-  Congested
-  Highly Congeste



2017 Unified Transportation Program (UTP)

2017-2026
Transportation Planning & Programming



Unified Transportation Plan



We Build Texas

*Field Guide to
Successful Project Delivery*



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

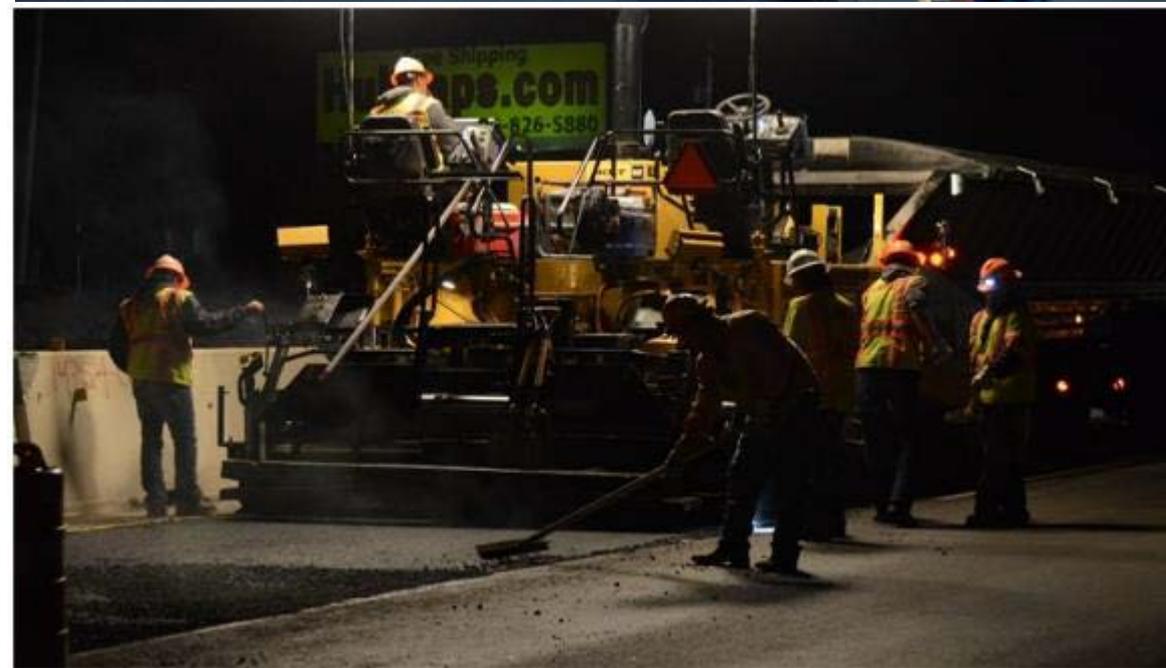
Working together to successfully deliver projects.



We Build Texas



Workforce



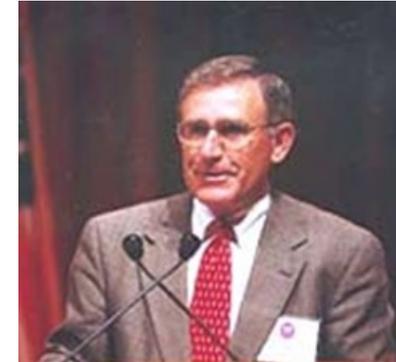
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- Texas Landscape
- **Texas History**
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- 1998 – Heald
 - Legislators – TxDOT & User Costs for Liquidated Damage
 - Commission – Reduce Construction Time
 - Incentives/disincentives
- 2001 – Johnson’s “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

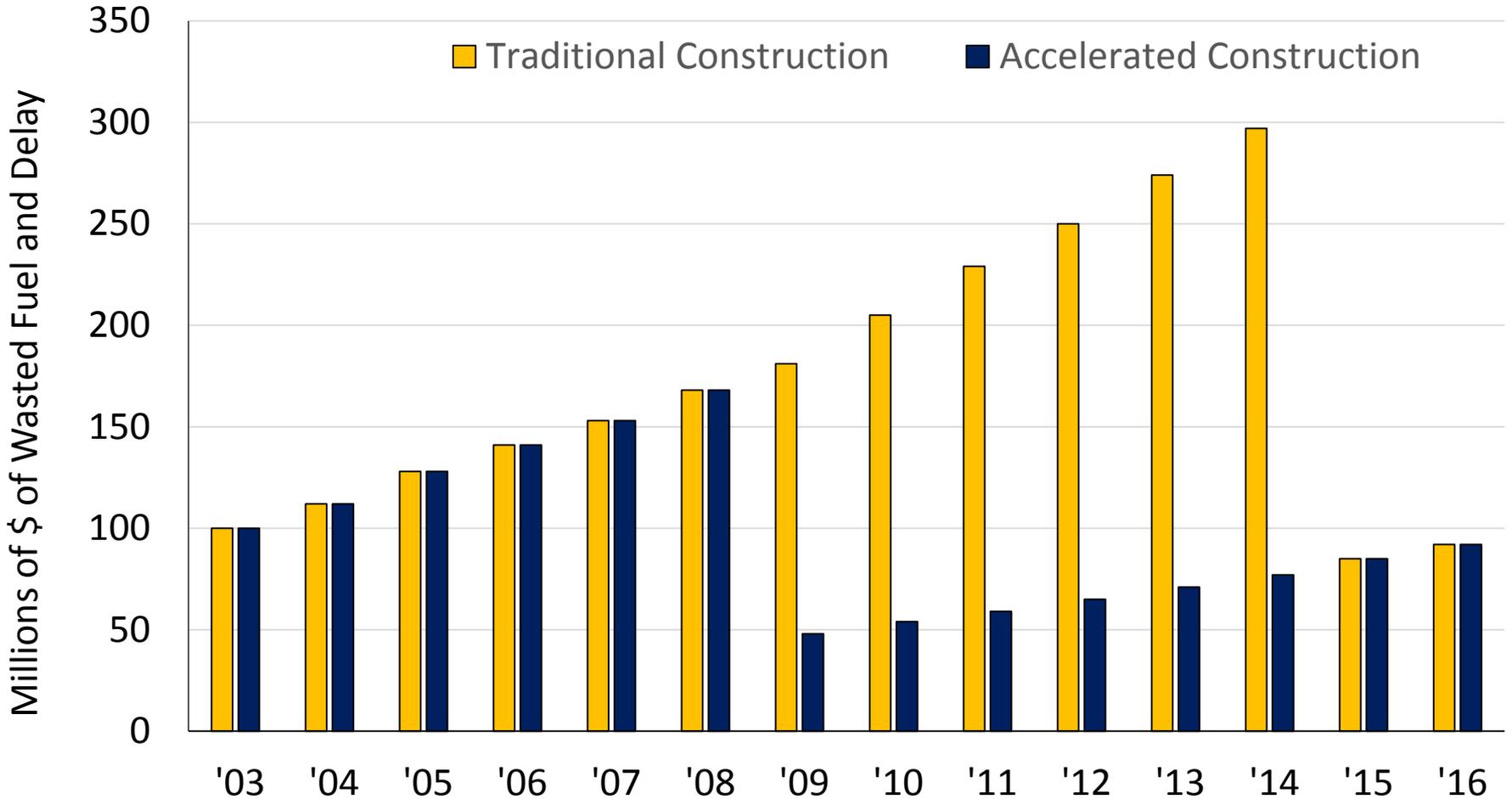
Supported by the
National Cooperative Highway Research Program

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



Estimated Value of Fuel Wasted and Time Delays on the Katy Freeway Project

Katy Freeway Economics



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



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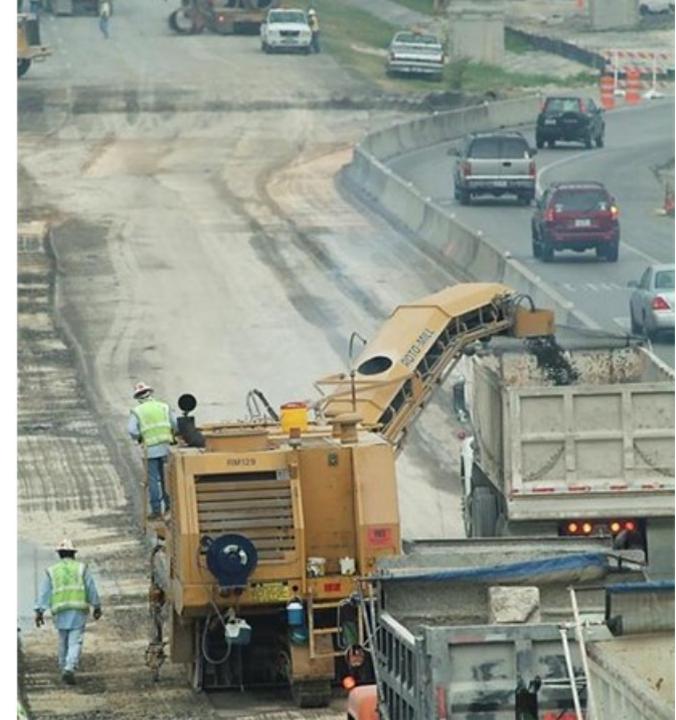
Barriers/Opportunities

- Materials
- Equipment
- QC/QA
- Traffic control
- Workforce
- Economic incentives
- Safety



Materials

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



Equipment

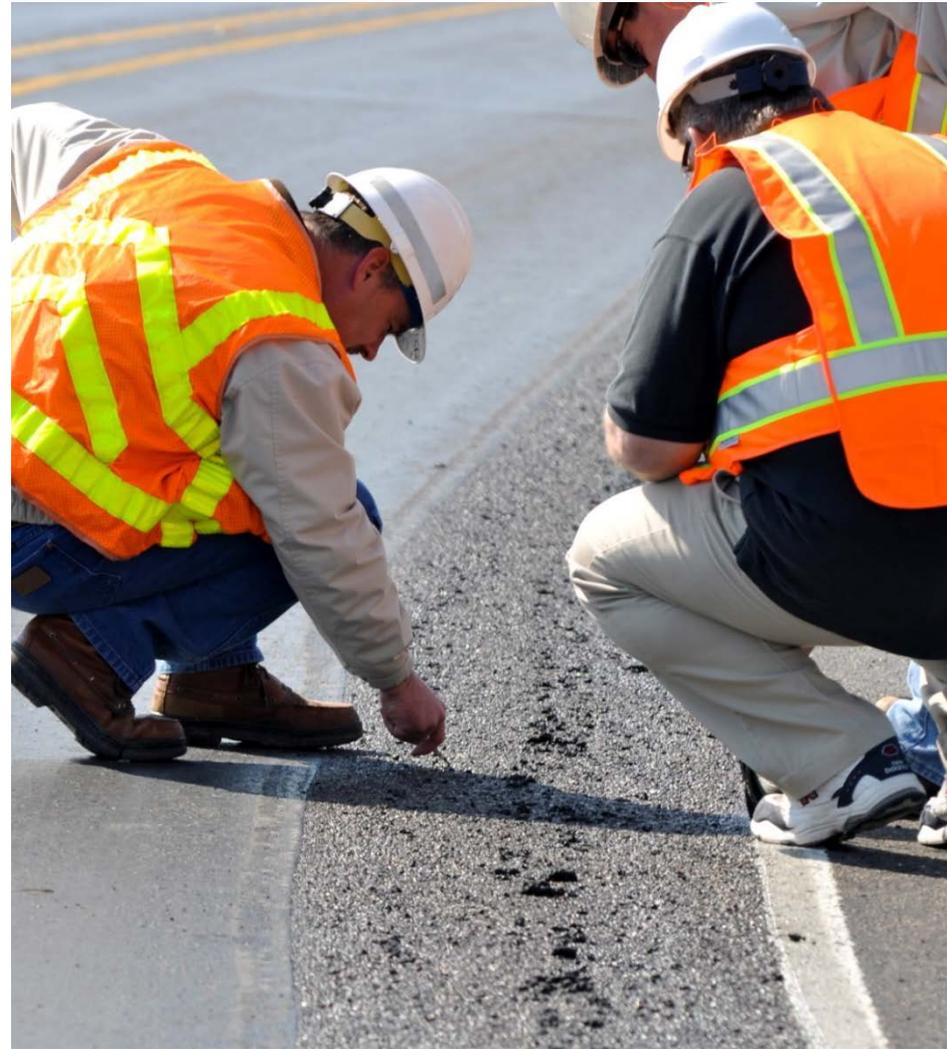


- Materials handling
- Demand for equipment
- Prototype/production unit/redesign
- Cost



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
- Contractor selection
- Construction considerations



Emergency Accelerated Construction

- Weather events
- Catastrophic traffic impacts (bridges)



Emergency Accelerated Construction

Contractor Selection

- Resources (equipment & workforce)
- Mobilization
- Financial capacity
- Relationships with material suppliers/fabricators
- Ability to communicate – suppliers/fabricators, public, contractor personnel



Emergency Accelerated Construction

Design

- Conservative
- Flexible
- Materials availability/logistics



Emergency Accelerated Construction



Other

- Technical experts on job
- Project level decisions



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
- Contractor control of workforce
- Innovative approaches to traffic handling



Outline

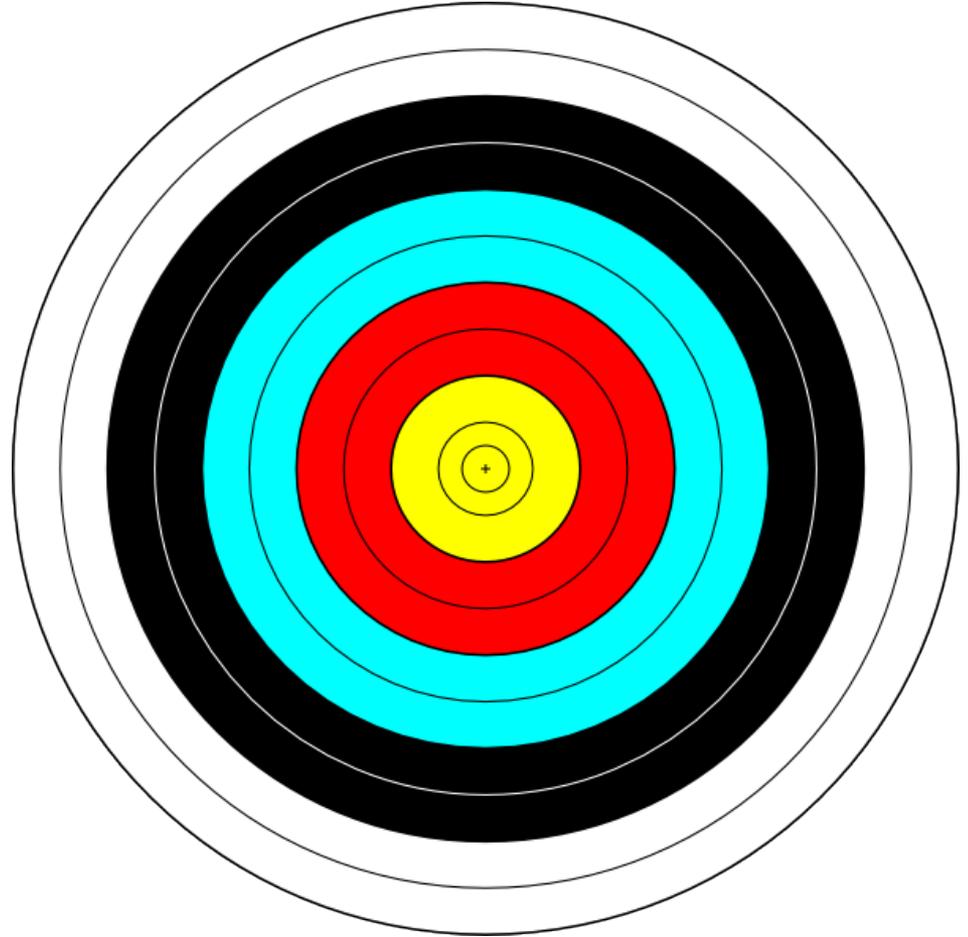
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Workshop Goals



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





CAUTION

Not All Projects Are
Suitable for
Accelerated Construction

District Workshops on Accelerated Construction

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June 13, 2017



District Workshops on Accelerated Construction Economic Screening Tools

AC-PP-17-04

David Ellis

Dallas/Fort Worth/Waco

Westin DFW

June 13, 2017





Economic Screening Tools

- TxDOT- 2003 Guides
- Preliminary Economic Screening Tool
- Project Level Economic Screening Tool
- CA4PRS



Project Level Economic Screening Tool



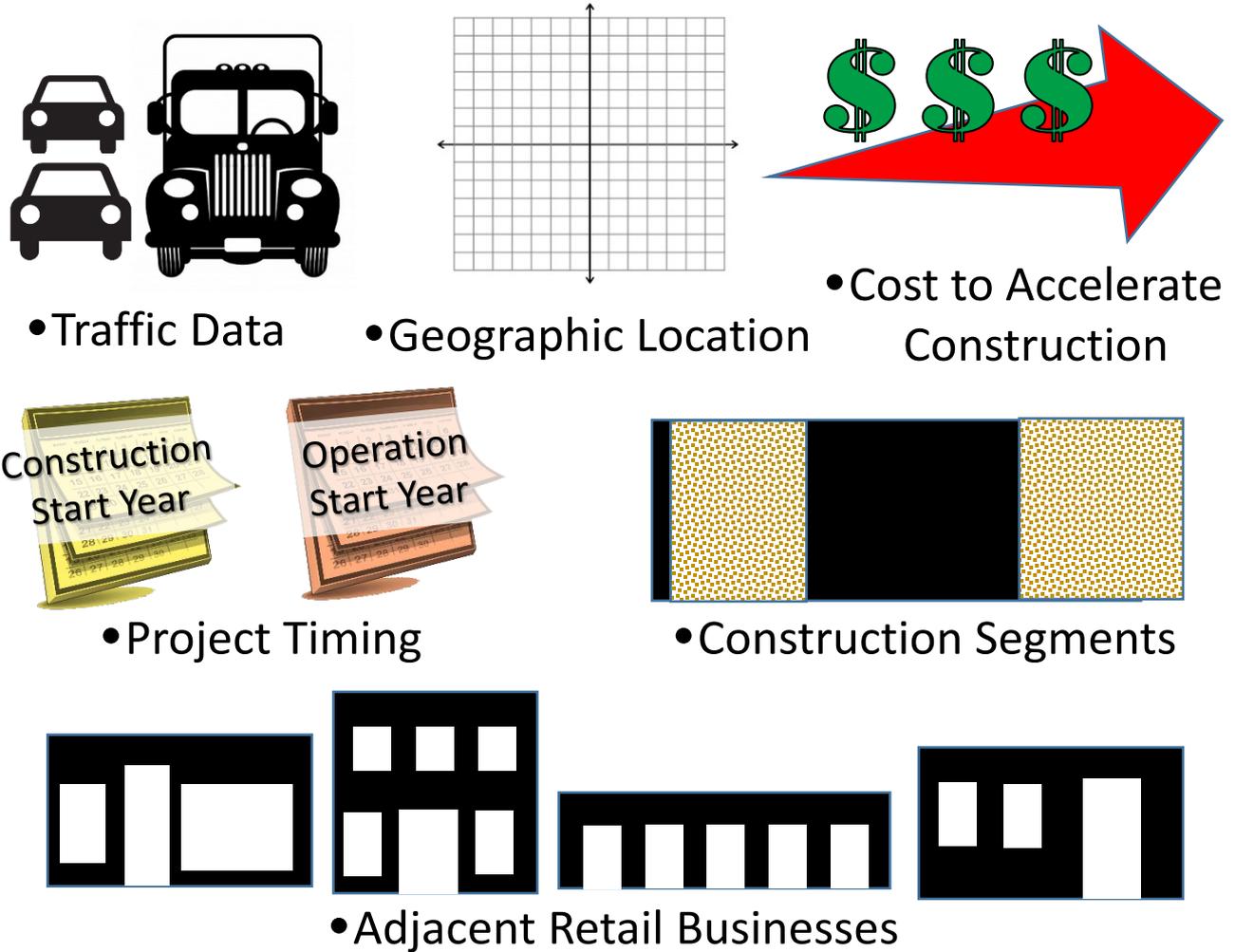
- Benefit-Cost tool
- Focus – road user costs and economic losses



Economic Impact

Project Level Economic Screening Tool

Inputs



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	55
Segment Length (miles)	6.0
Pre Construction ADT	47,000
Percent Trucks	10%
Project Region	Suburban
Retail (SQFT)	48,000
Travel Time per Trip (minutes)	6.5

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	\$3,000,000
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	\$69,823,841
Truck Travel Time Value	\$13,542,768
Total Travel Time Value	\$83,366,609
Automobile Operating Cost	\$20,890,047
Truck Operating Cost	\$10,410,415
Total Operating Cost	\$31,300,462

Accelerated Construction Scenario	Values
Automobile Travel Time Value	\$28,317,447
Truck Travel Time Value	\$5,492,345
Total Travel Time Value	\$33,809,791
Automobile Operating Cost	\$8,472,075
Truck Operating Cost	\$4,222,001
Total Operating Cost	\$12,694,076

Preconstruction Conditions

NOTE: There can be significant differences between the type of business as well as the geographic location. For the purposes of this model, the default method of calculation is based on the different area types from various geographic locations. If different area types, there can be significant differences in the results depending on the specific geographic location. The model provides general guidance.

Project Parameters	Values
Average Operating Speed	55
Segment Length (miles)	6.0
Pre Construction ADT	47,000
Percent Trucks	10%
Project Region	Suburban
Retail (SQFT)	48,000
Travel Time per Trip (minutes)	6.5

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

Accelerated Construction Parameters
Added Cost of Accelerated Construction
Added Cost of Incentives
Total Project Period (calendar days)
Percent of ADT that is Traveling During Peak Periods

Traditional Construction Scenario	Values
Automobile Travel Time Value	\$69,823,841
Truck Travel Time Value	\$13,542,768
Total Travel Time Value	\$83,366,609
Automobile Operating Cost	\$20,890,047
Truck Operating Cost	\$10,410,415
Total Operating Cost	\$31,300,462

Accelerated Construction Scenario
Automobile Travel Time Value
Truck Travel Time Value
Total Travel Time Value
Automobile Operating Cost
Truck Operating Cost
Total Operating Cost



Preconstruction Conditions

	Values
	55
	6.0
	47,000
	10%
	Suburban
	48,000
	6.5

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.

	Values
	900
Periods	75%

Accelerated Construction Parameters	Values
Added Cost of Accelerate Construction	\$3,000,000
Added Cost of Incentives	
Total Project Period (calendar days)	365
Percent of ADT that is Traveling During Peak Periods	75%

	Values
	\$69,823,841
	\$13,542,768
	\$83,366,609
	\$20,890,047
	\$10,410,415
	\$31,300,462

Accelerated Construction Scenario	Values
Automobile Travel Time Value	\$28,317,447
Truck Travel Time Value	\$5,492,345
Total Travel Time Value	\$33,809,791
Automobile Operating Cost	\$8,472,075
Truck Operating Cost	\$4,222,001
Total Operating Cost	\$12,694,076

Project Level Economic Screening Tool



Construction Conditions

Traditional Construction Parameters	Values
<i>Segment 1:</i>	
Days	450
Segment Length	3
Average Operating Speed (Peak)	20
Average Operating Speed (Off-Peak)	50
Percent of Traffic Diverted	5%
<i>Segment 2:</i>	
Days	450
Segment Length	3
Average Operating Speed (Peak)	20
Average Operating Speed (Off-Peak)	50
Percent of Traffic Diverted	5%
<i>Segment 3:</i>	
Days	
Segment Length	
Average Operating Speed (Peak)	
Average Operating Speed (Off-Peak)	
Percent of Traffic Diverted	
<i>Segment 4:</i>	
Days	
Segment Length	
Average Operating Speed (Peak)	
Average Operating Speed (Off-Peak)	
Percent of Traffic Diverted	

Accelerated Construction Parameters	Values
<i>Segment 1:</i>	
Days	180
Segment Length	3
Average Operating Speed (Peak)	20
Average Operating Speed (Off-Peak)	50
Percent of Traffic Diverted	5%
<i>Segment 2:</i>	
Days	185
Segment Length	3
Average Operating Speed (Peak)	20
Average Operating Speed (Off-Peak)	50
Percent of Traffic Diverted	5%
<i>Segment 3:</i>	
Days	
Segment Length	
Average Operating Speed (Peak)	
Average Operating Speed (Off-Peak)	
Percent of Traffic Diverted	
<i>Segment 4:</i>	
Days	
Segment Length	
Average Operating Speed (Peak)	
Average Operating Speed (Off-Peak)	
Percent of Traffic Diverted	

Construction Conditions

Traditional Construction Parameters	Values
<i>Segment 1:</i>	
Days	450
Segment Length	3
Average Operating Speed (Peak)	20
Average Operating Speed (Off-Peak)	50
Percent of Traffic Diverted	5%
<i>Segment 2:</i>	
Days	450
Segment Length	3
Average Operating Speed (Peak)	20
Average Operating Speed (Off-Peak)	50
Percent of Traffic Diverted	5%
<i>Segment 3:</i>	
Days	
Segment Length	
Average Operating Speed (Peak)	
Average Operating Speed (Off-Peak)	
Percent of Traffic Diverted	
<i>Segment 4:</i>	
Days	
Segment Length	
Average Operating Speed (Peak)	
Average Operating Speed (Off-Peak)	
Percent of Traffic Diverted	

Accelerated Construction Parameters
<i>Segment 1:</i>
Days
Segment Length
Average Operating Speed (Peak)
Average Operating Speed (Off-Peak)
Percent of Traffic Diverted
<i>Segment 2:</i>
Days
Segment Length
Average Operating Speed (Peak)
Average Operating Speed (Off-Peak)
Percent of Traffic Diverted
<i>Segment 3:</i>
Days
Segment Length
Average Operating Speed (Peak)
Average Operating Speed (Off-Peak)
Percent of Traffic Diverted
<i>Segment 4:</i>
Days
Segment Length
Average Operating Speed (Peak)
Average Operating Speed (Off-Peak)
Percent of Traffic Diverted



Construction Conditions

Construction Parameters	Values	Accelerated Construction Parameters	Values
		<i>Segment 1:</i>	
	450	Days	180
	3	Segment Length	3
(k)	20	Average Operating Speed (Peak)	20
(Peak)	50	Average Operating Speed (Off-Peak)	50
	5%	Percent of Traffic Diverted	5%
		<i>Segment 2:</i>	
	450	Days	185
	3	Segment Length	3
(k)	20	Average Operating Speed (Peak)	20
(Peak)	50	Average Operating Speed (Off-Peak)	50
	5%	Percent of Traffic Diverted	5%
		<i>Segment 3:</i>	
		Days	
		Segment Length	
(k)		Average Operating Speed (Peak)	
(Peak)		Average Operating Speed (Off-Peak)	
		Percent of Traffic Diverted	
		<i>Segment 4:</i>	
		Days	
		Segment Length	
(k)		Average Operating Speed (Peak)	
(Peak)		Average Operating Speed (Off-Peak)	
		Percent of Traffic Diverted	

Project Level Economic Screening Tool



Traditional Construction Scenario

- Calculates Road User Costs consisting of:
 - Travel Time Values
 - Vehicle Operating Costs

Accelerated Construction Scenario

- Calculates Road User Costs consisting of:
 - Travel Time Values
 - Vehicle Operating Costs

Project Level Economic Screening Tool



Economic
Loss

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

Project Level Economic Screening Tool



Segment 4:	
Automobile Operating Cost (Peak)	\$0
Automobile Operating Cost (Off-Peak)	\$0
Truck Operating Cost (Peak)	\$0
Truck Operating Cost (Off-Peak)	\$0
Total Segment 4 Operating Cost	\$0
Total Travel Time Value	\$185,125,976
Total Operating Cost	\$69,506,588
Total Road User Costs (Preconstruction - Construction)	\$139,965,493

Segment 4:	
Automobile Operating Cost (Peak)	\$0
Automobile Operating Cost (Off-Peak)	\$0
Truck Operating Cost (Peak)	\$0
Truck Operating Cost (Off-Peak)	\$0
Total Segment 4 Operating Cost	\$0
Total Travel Time Value	\$82,375,459
Total Operating Cost	\$28,030,032
Total Road User Costs (Preconstruction - Construction)	\$63,901,624

Adjacent Businesses

Traditional Construction Scenario	Values
Loss of Sales	\$16,740,000
Loss of State Sales Tax Revenue	\$1,046,250
Loss of Local Sales Tax Revenue	\$167,400
Total Economic Loss	\$17,953,650

Accelerated Construction Scenario	Values
Loss of Sales	\$6,789,000
Loss of State Sales Tax Revenue	\$424,313
Loss of Local Sales Tax Revenue	\$67,890
Total Economic Loss	\$7,281,203

Traditional Construction Business Factor Overrides	Values
Loss of Sales Percentage- Urban	
Loss of Sales Percentage- Suburban	
Loss of Sales Percentage- Rural	
Sales per Square Foot- Urban	
Sales per Square Foot- Suburban	
Sales per Square Foot- Rural	

Accelerated Construction Business Factor Overrides	Values
Loss of Sales Percentage- Urban	
Loss of Sales Percentage- Suburban	
Loss of Sales Percentage- Rural	
Sales per Square Foot- Urban	
Sales per Square Foot- Suburban	
Sales per Square Foot- Rural	

Segment 4:	
Automobile Operating Cost (Peak)	\$0
Automobile Operating Cost (Off-Peak)	\$0
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Loss of Sales Percentage- Urban	
Loss of Sales Percentage- Suburban	
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Sales per Square Foot- Urban	
Sales per Square Foot- Suburban	
Sales per Square Foot- Rural	

Accelerated Construction Business Factor Overrides	Values
Loss of Sales Percentage- Urban	
Loss of Sales Percentage- Suburban	
Loss of Sales Percentage- Rural	
Sales per Square Foot- Urban	
Sales per Square Foot- Suburban	
Sales per Square Foot- Rural	

\$0
\$0
\$0
\$0
\$0
\$0
\$185,125,976
\$69,506,588
onstruction) \$139,965,493

<i>Segment 4:</i>	
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Total Travel Time Value	\$82,375,459
Total Operating Cost	\$28,030,032
Total Road User Costs (Preconstruction - Construction)	\$63,901,624

Adjacent Businesses

Ratio	Values
	\$16,740,000
	\$1,046,250
	\$167,400
	\$17,953,650

Accelerated Construction Scenario		Values
Loss of Sales		\$6,789,000
Loss of State Sales Tax Revenue		\$424,313
Loss of Local Sales Tax Revenue		\$67,890
Total Economic Loss		\$7,281,203

Factor Overrides	Values

Accelerated Construction Business Factor Overrides		Values
Loss of Sales Percentage- Urban		
Loss of Sales Percentage- Suburban		
Loss of Sales Percentage- Rural		
Sales per Square Foot- Urban		
Sales per Square Foot- Suburban		
Sales per Square Foot- Rural		

Project Level Economic Screening Tool

Results

Traditional Construction Totals

Values

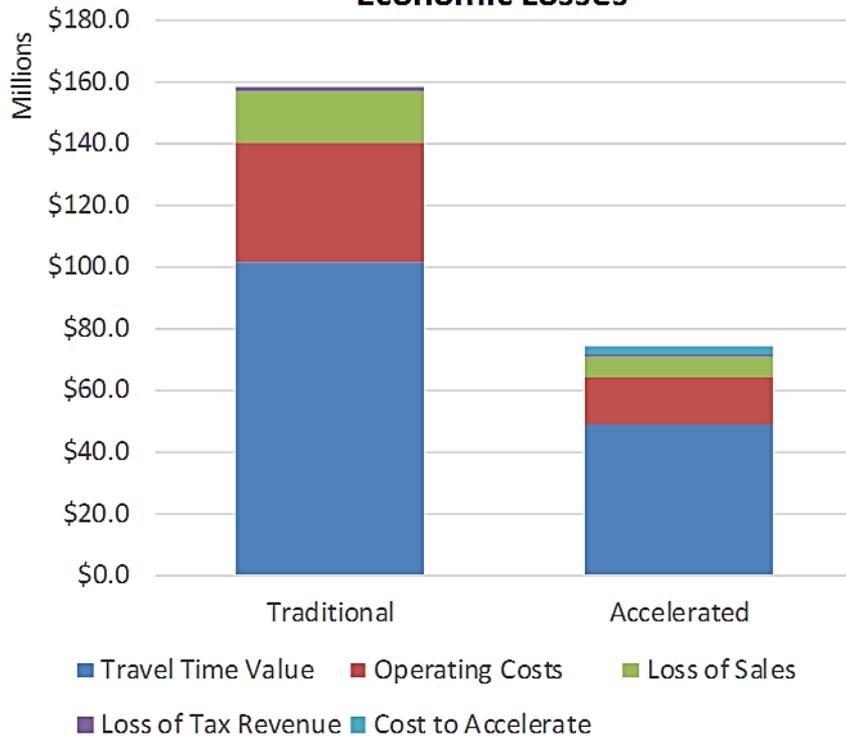
Total Road User Costs and Economic Loss	\$157,919,143
--	----------------------

Accelerated Construction Totals

Values

Total Road User Costs and Economic Loss	\$71,182,826
--	---------------------

Estimated User Costs and Economic Losses



Traditional vs Accelerated

Values

Change in Road User Costs and Economic Loss	\$86,736,317
Road User Cost and Economic Loss Daily Cost	\$162,124
B/C of Accelerated Construction	28.91

Results

Traditional Construction Totals

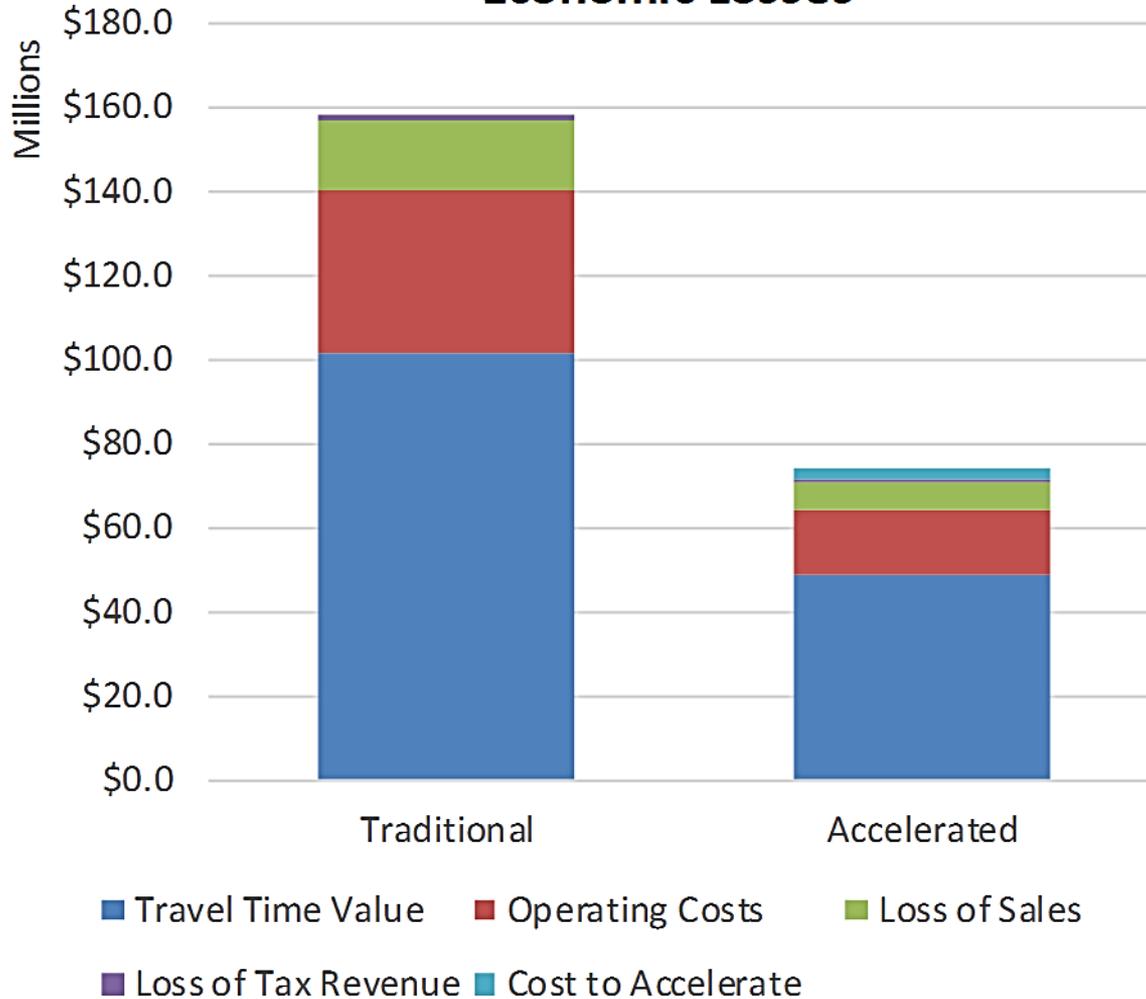
Values

Total Road User Costs and Economic Loss **\$157,919,143**

Accelerated Construction

Total Road User Costs and Economic Loss

Estimated User Costs and Economic Losses



Traditional vs Accelerated

Change in Road User Costs and Economic Losses

Road User Cost and Economic Loss

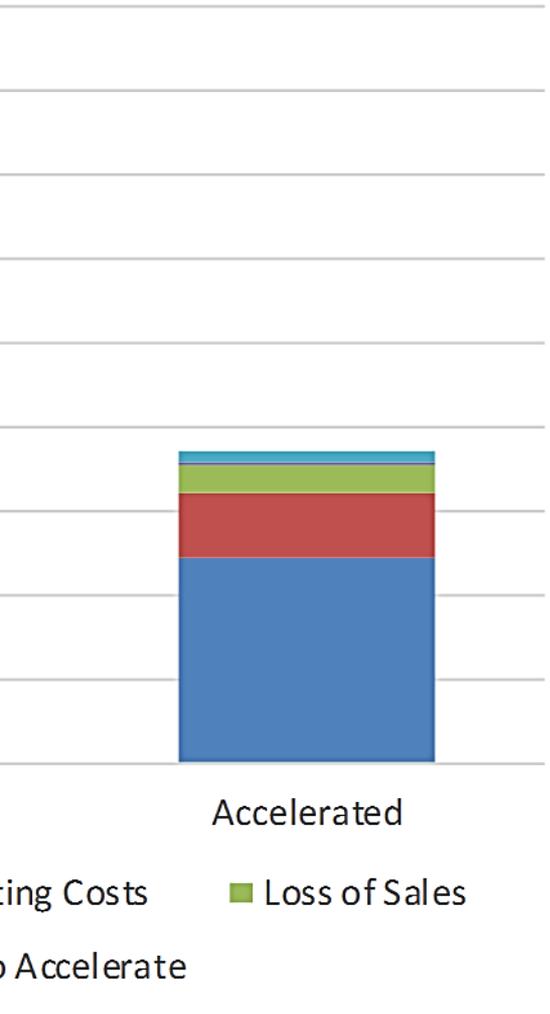
B/C of Accelerated Construction

Results

Totals	Values
Loss	\$157,919,143

Accelerated Construction Totals	Values
Total Road User Costs and Economic Loss	\$71,182,826

User Costs and Economic Losses



Traditional vs Accelerated	Values
Change in Road User Costs and Economic Loss	\$86,736,317
Road User Cost and Economic Loss Daily Cost	\$162,124
B/C of Accelerated Construction	28.91

ing Costs ■ Loss of Sales
 o Accelerate

District Workshops on Accelerated Construction

Dallas/Fort Worth/Waco

Westin DFW

June 13, 2017



District Workshops on
Accelerated Construction
Project Development
AC-PP-17-05
Tracy Cain

Dallas/Fort Worth/Waco

Westin DFW

June 13, 2017



OUTLINE



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



TxDOT RESOURCES

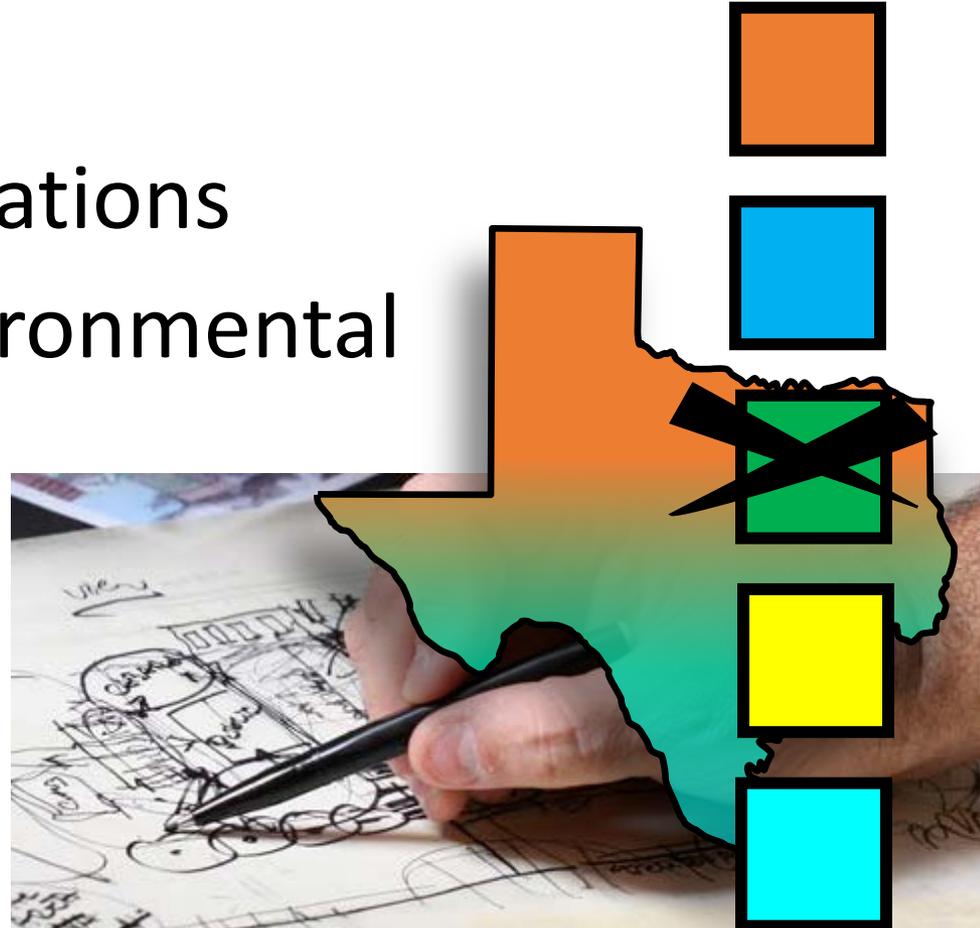


- Project Development Process Manual-2017
- Bridge Project Development Manual-2016
- PS&E Preparation Manual-2016
- Roadway Design Manual-2014
- Bridge Design Manual-2015
- Bridge Detailing Guide-2016
- Pavement Design Manual-2011
- Hydraulic Design Manual-2016
- Texas Manual on Uniform Traffic Control 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

General Guidelines

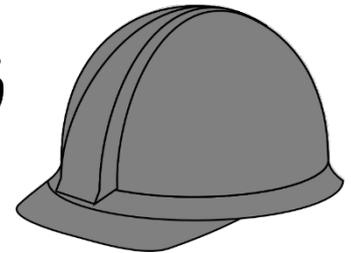
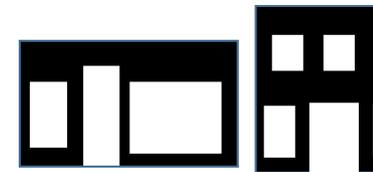
- Two lane road widening (rural or suburban)
 - Lane widths
 - Shoulder widths
 - Limited ROW
 - Traffic control
 - Limited detours available



PROJECT SELECTION & PLANNING

Economic Considerations

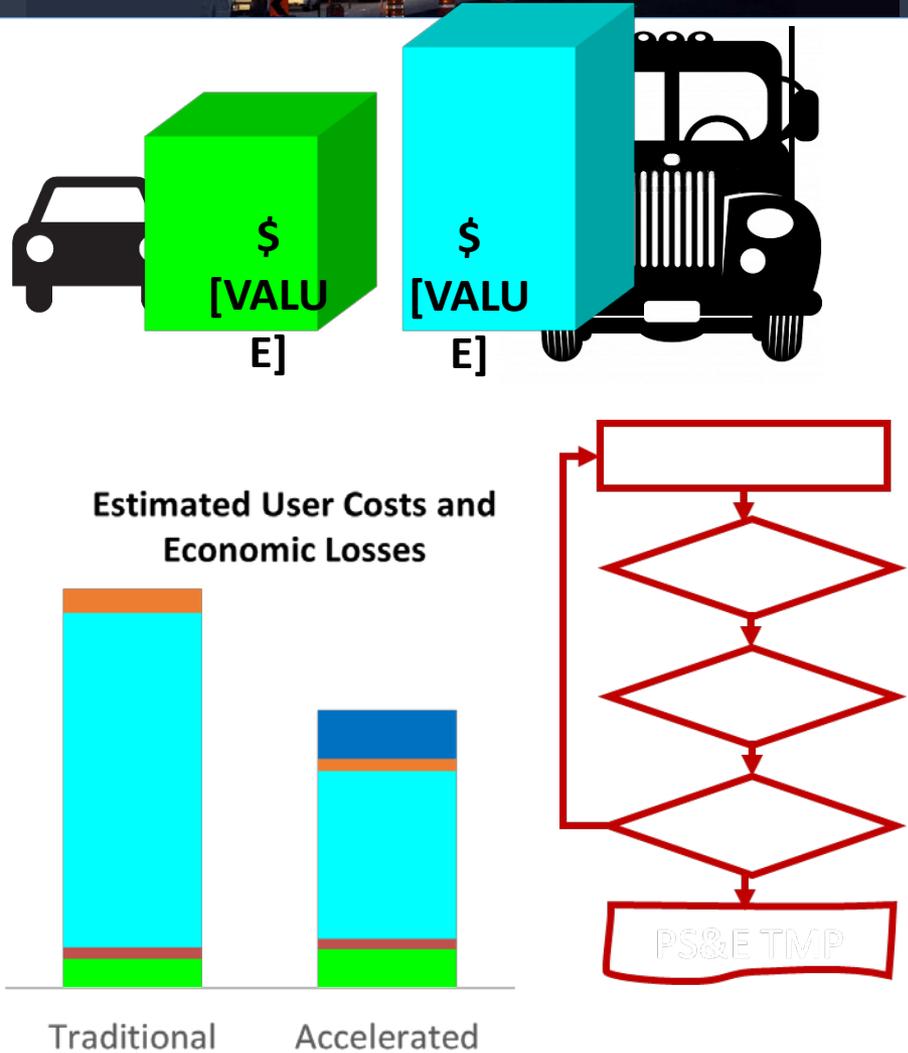
- Agency Administrative Costs
- Road User Costs
- Non-User Costs
(adjacent businesses)
- Construction Costs
- Contractor Management Costs



PROJECT SELECTION & PLANNING

Calculation Tools

- TxDOT Road User Cost Calculator
- Preliminary Economic Screening Tool
- Project Level Economic Screening Tool
- CA4PRS-construction alternatives



PROJECT SELECTION & PLANNING



ROW, Utilities, Environmental & Railroads

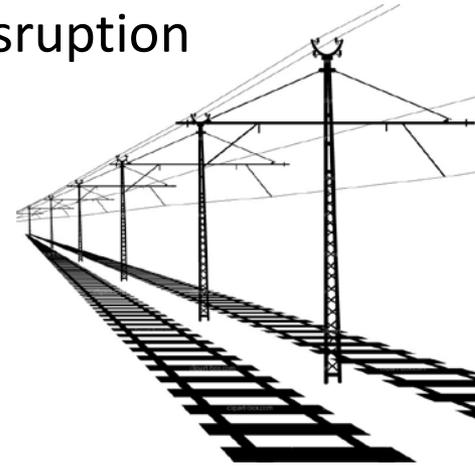
- ROW
 - One side or both sides of project
 - Traffic handling
 - Work space
 - No. of parcels
 - Fencing, driveways, noise
 - Complete prior to start of construction



PROJECT SELECTION & PLANNING

ROW, Utilities, Environmental & Railroads

- Utilities
 - Relocate prior to start of traffic disruption (if possible)
 - Relationships with utilities
 - Utility coordinator (contractor & TxDOT)
- Environmental, Historic Preservation & Archaeology
 - Complete prior to start of traffic disruption
 - Archaeology surprises
- Railroad
 - Coordination
 - Obtain access



PROJECT SELECTION & PLANNING

Risk Assessment

- Identify potential problems
- Evaluate the severity of impact
- Provide alternative solutions
- Track events



PROJECT SELECTION & PLANNING



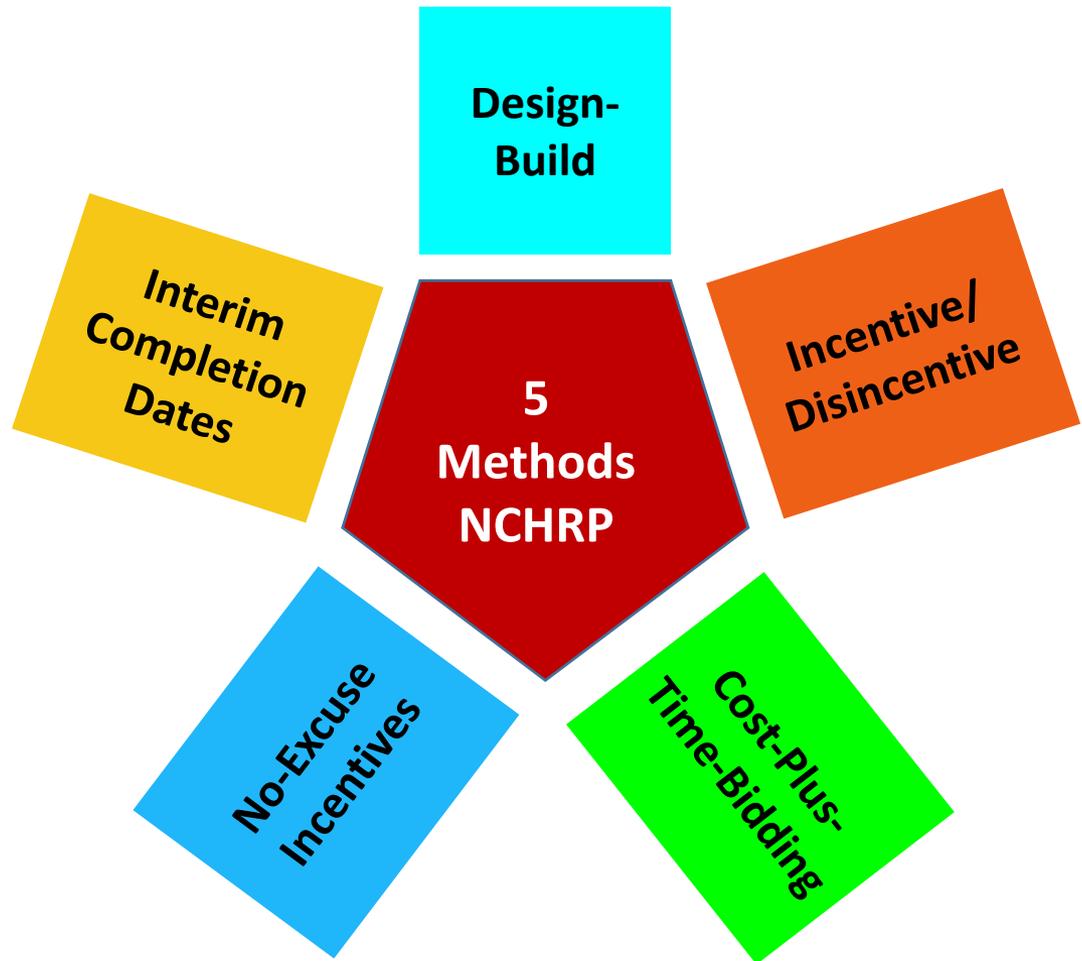
Public Information

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



Alternative Contracting Types

Types –
5 methods best
for accelerated
construction
(NCHRP 2008)

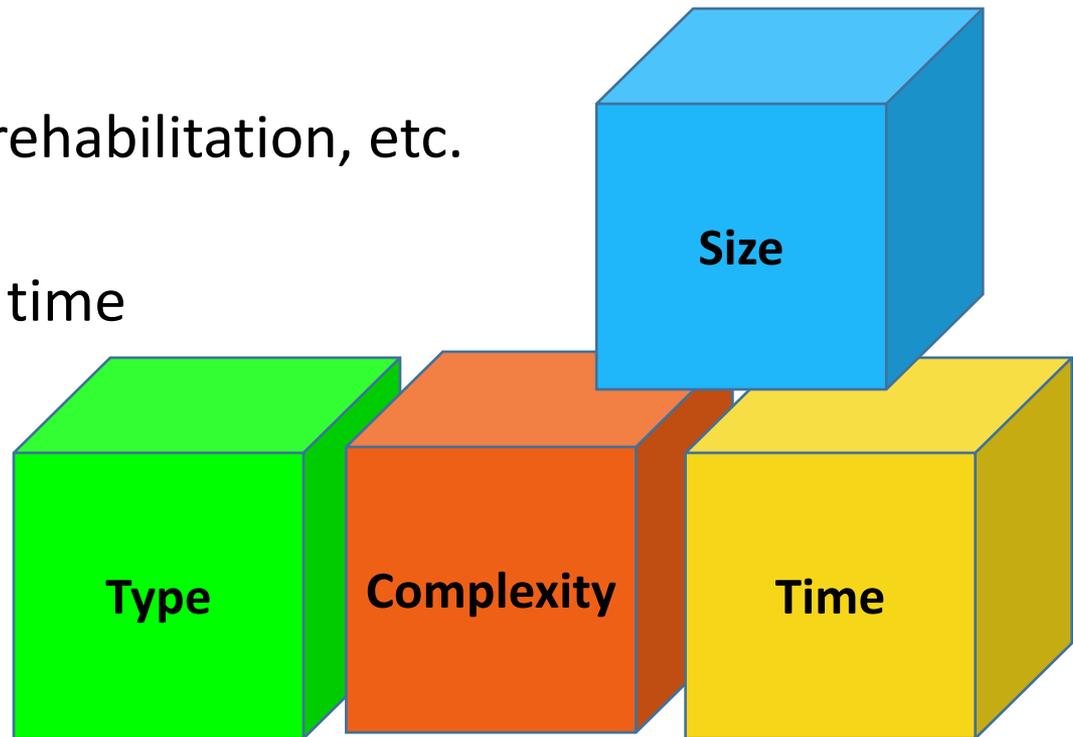


Contracting Methods



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



Selection of Contracting Method

- Risks allocated to party best able to exercise control over risk
- Define work restrictions-work hours, vibrations, noise, environmental, etc.
- Designer, contractor and public agency work together



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



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

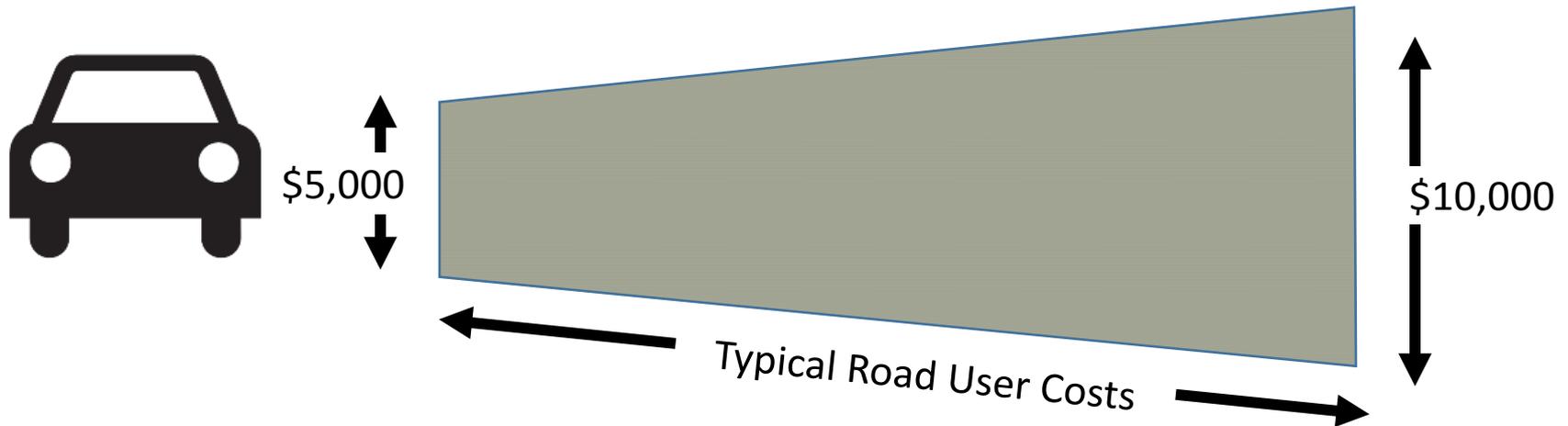
A + B

Contracting Methods



A+B Contracting

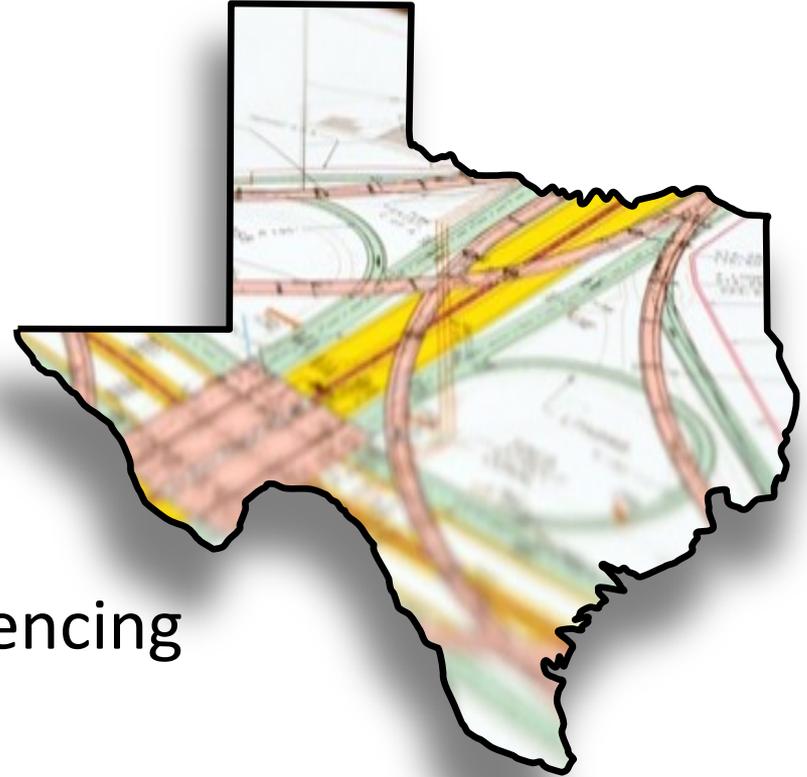
- Consider user and non-user costs
- Estimated value of B should not be more than 40% of A
- Constructability reviews



DESIGN



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



DESIGN



General Considerations

- Minimize mobilization/demobilization
- Minimize materials logistics
- Minimize profile changes
- Repeatable features



DESIGN



Geometric Design

- Consider construction sequencing, traffic handling, construction work space needs
- Traffic handling
 - Same No. of lanes during construction
 - Wide as possible lanes
 - Use of shoulders to handle traffic
- Detours and shoulder widths
- Future lane expansion
- Constructability reviews



DESIGN



Bridge Design

- TxDOT active in Accelerated Bridge Design
- Consult with experts in TxDOT (Divisions & Districts)
- Time consuming element of a project
- Off site manufacturing of bridge components
- Lead time for materials and fabrication
- Strength gain of PCC
- Bridge rail constructability
- Constructability review



DESIGN



Drainage Design

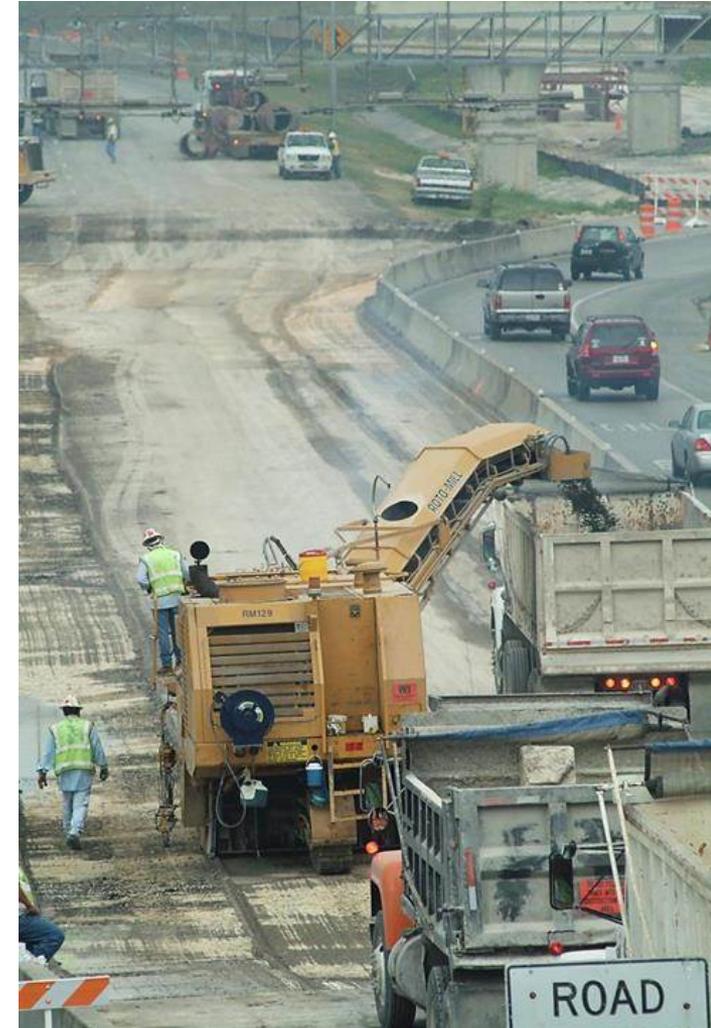
- Consider constructability
- Type of conduits
- Type of structures
- Interference with utilities
- Retrofit existing conduits
- Constructability review

DESIGN



Pavement Design

- Evaluate condition of existing pavement
- Recycle existing materials
- Minimize moving materials
- Reuse detour materials
- Locate production plants on job site
- Stabilize materials
- High load carrying capacity materials
- Constructability review



DESIGN



Roadside Safety Design

- Use TxDOT manuals
- Constructability review

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

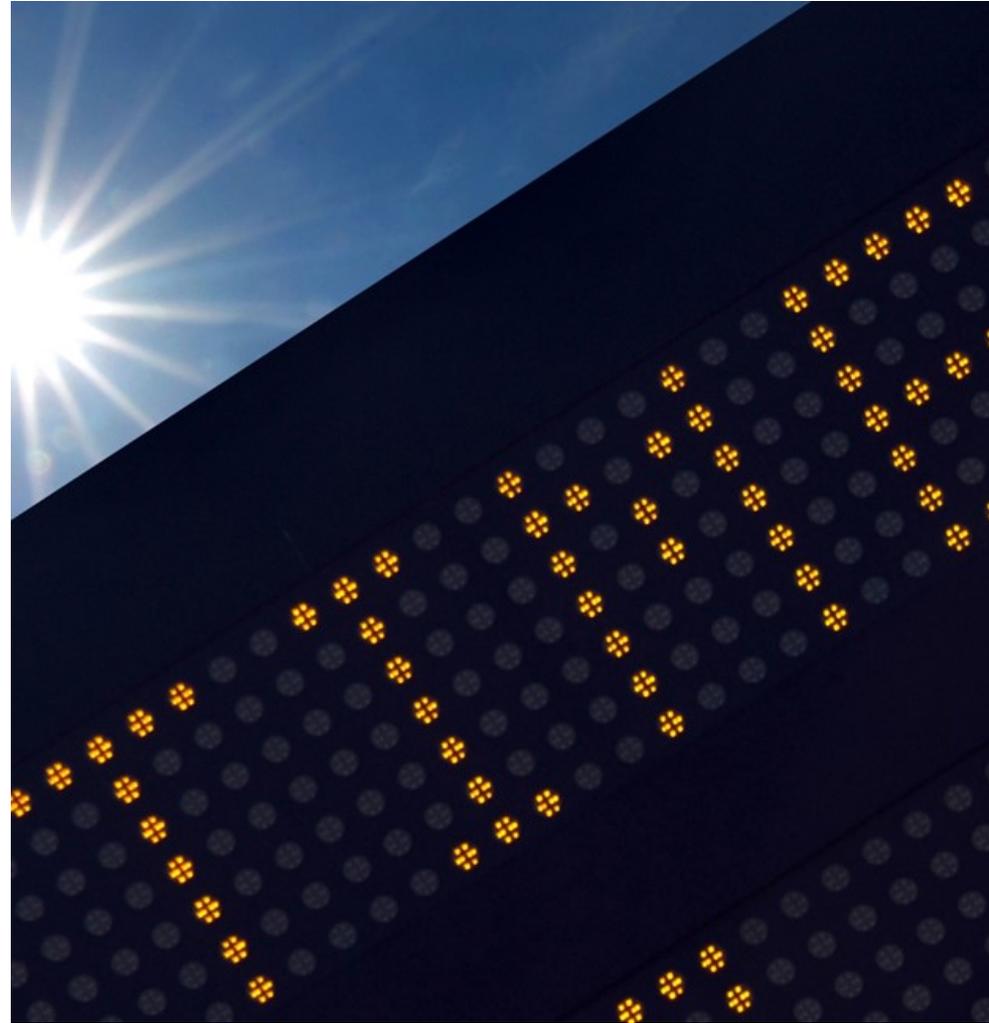


DESIGN



Project Duration

- Need accurate estimate
- Incentives/disincentives dependent on duration
- Consult with contracting community



DESIGN



Project Duration

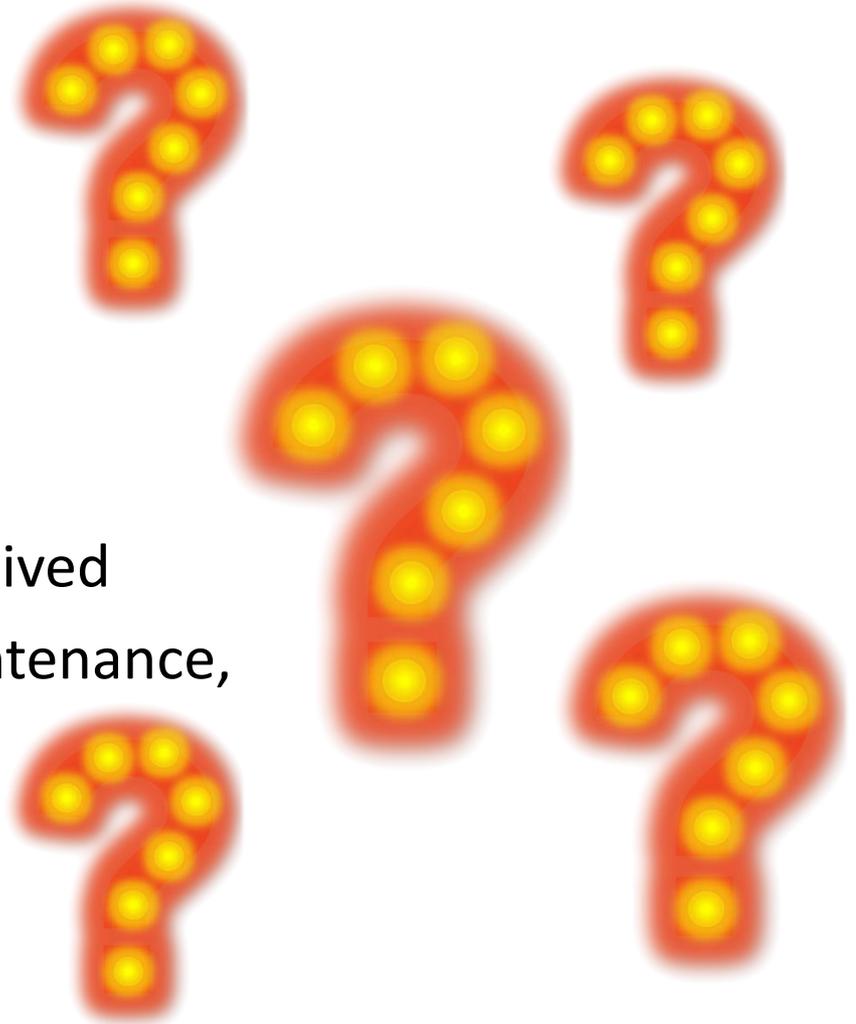
- ROW, utilities, environmental, archeology, railroads
- Completeness of plans and specifications
- Quantities of work
- Impacts of weather
- Temperature and time requirements for certain materials
- Vegetation establishment and time of year
- Materials availability
- Production rates
- Consult with contracting community

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

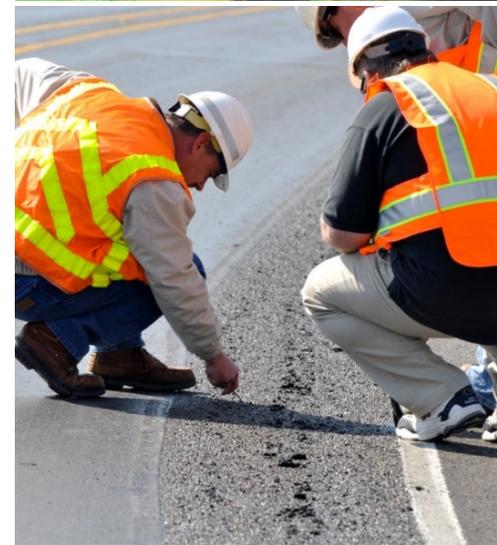


Contractor Selection



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



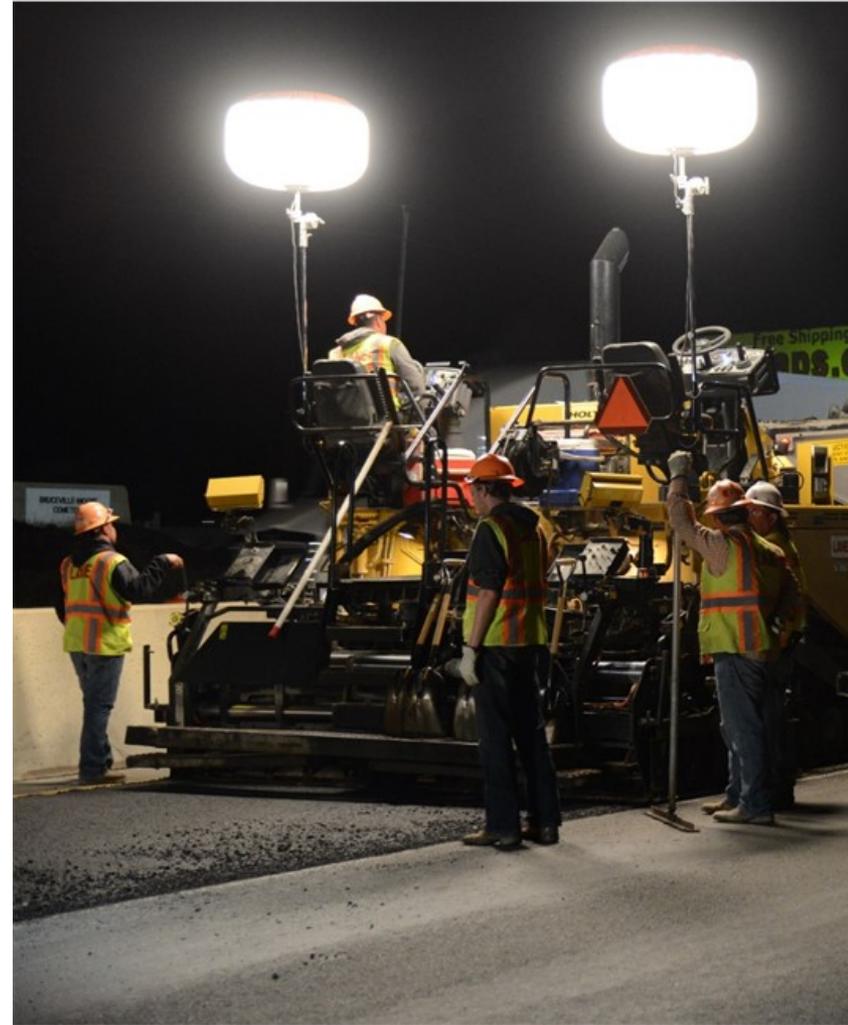
Partnering

- 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



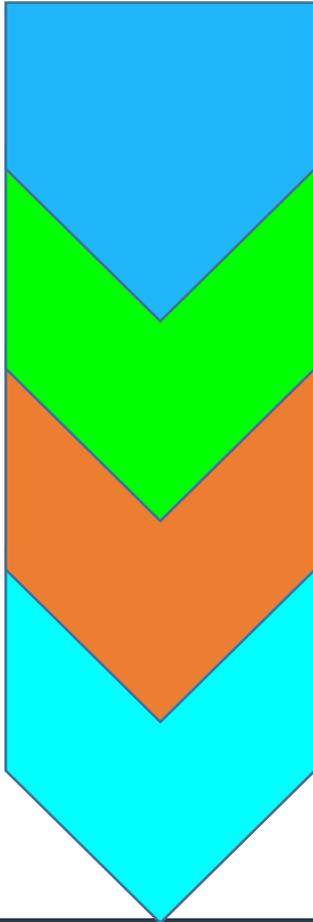
General Considerations

- 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



- Extremely important for success
- Marriage of time, space, traffic control and construction operations
- Advanced scheduling tools
- Adjust plan as work progresses

CONSTRUCTION CONSIDERATIONS

Workforce

- Decision makers on the project
- Co-location of decision makers
- Decision making at as low a level in organizations as possible
- Proper skill sets (technical/labor workforce) available
- Quality control workforce



CONSTRUCTION CONSIDERATIONS

Workspace

- On project for removal and placement of materials
- Adjacent to project for staging of materials and equipment



CONSTRUCTION CONSIDERATIONS

Equipment

- Correct equipment to perform job
- Maintained and operational
- Key equipment back-ups
- New equipment may need to be developed



CONSTRUCTION CONSIDERATIONS

Quality Control/Quality Assurance

- Personnel with adequate skill set (certified)
- Testing equipment and laboratory (accredited)
- Quality cannot be sacrificed because of speed of construction
- New equipment may need to be developed
- Decisions on acceptance of materials made on job



CONSTRUCTION CONSIDERATIONS

Information Exchange

- Information flow at rapid rate
- Electronic files and transmission of information
- Set required meeting times
- Special meetings as required
- Solve and avoid problems with communication



Summary



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



District Workshops on Accelerated Construction

Dallas/Fort Worth/Waco

Westin DFW

June 13, 2017





ACCELERATED BRIDGE CONSTRUCTION IN TEXAS (AND BEYOND)

Walter (Ray) Fisher – Dallas District

Prapti Sharma – Fort Worth District

Graham Bettis – Bridge Division



Accelerated Bridge Construction (ABC) Techniques

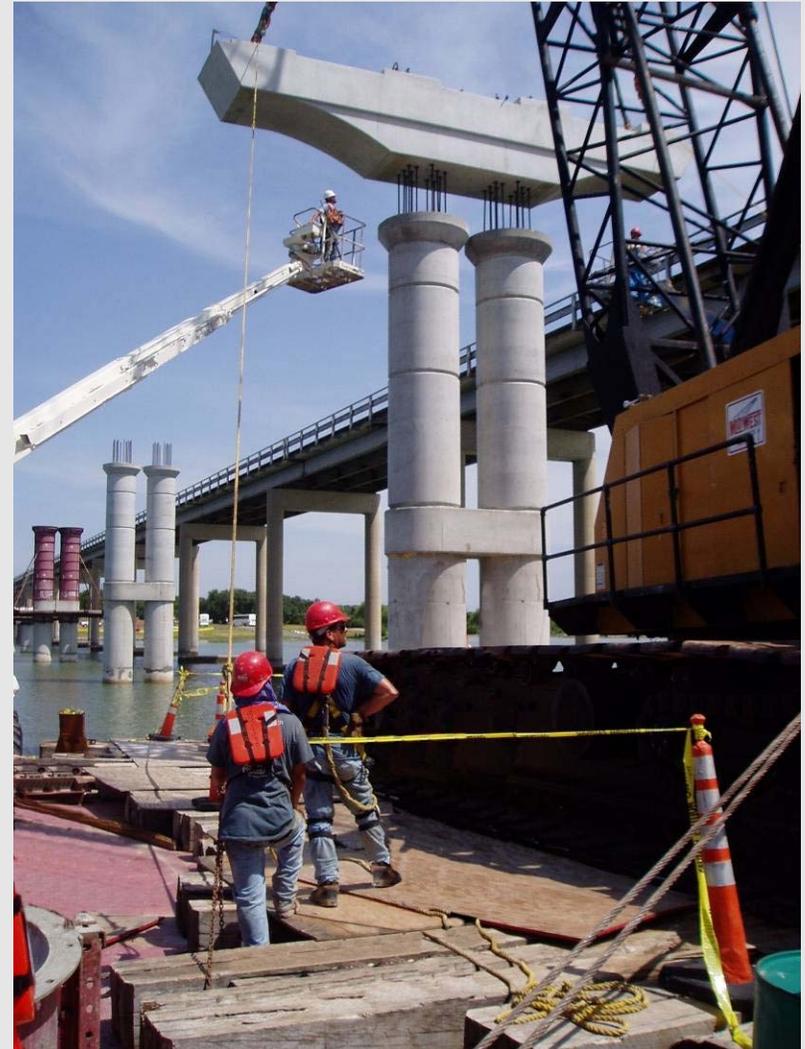
- 1 Prefabricated Elements
- 2 Self Propelled Modular Transporters (SPMTs)
- 3 Lateral Slide-in Bridge Construction
- 4 Modular Units



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 Abutments



Precast Columns



TxDOT's Bread & Butter: Girders and Deck Panels



Lake Ray Hubbard Precast Bent Caps



Lake Ray Hubbard Precast Bent Caps



Dallas High Five Interchange



Dallas High Five Interchange



Dallas High Five Interchange



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 by themselves do not really constitute “Accelerated Bridge Construction.”
- Now let’s talk fast!



Decked Slab Beams: 6 – 10 Day Construction Projects



FM 4 at Salt Creek



Self Propelled Modular Transporters (SPMTs)



Photo Courtesy of
Heavy Equipment Guide

Self Propelled Modular Transporters (SPMTs)



Photos Courtesy of Heavy Equipment Guide



Photo Courtesy of FHWA

West 7th Street Bridge in Fort Worth

- Out of service 150 days maximum. Typical construction time = 12 to 18 months.
- \$33,000 per day incentive/disincentive.
- Floor beams and deck panels fabricated in precast yard.
- Arches cast offsite (but nearby), then moved to site using SPMTS.



West 7th Street Bridge in Fort Worth



West 7th Street Bridge in Fort Worth



West 7th Street Bridge in Fort Worth



West 7th Street Bridge in Fort Worth

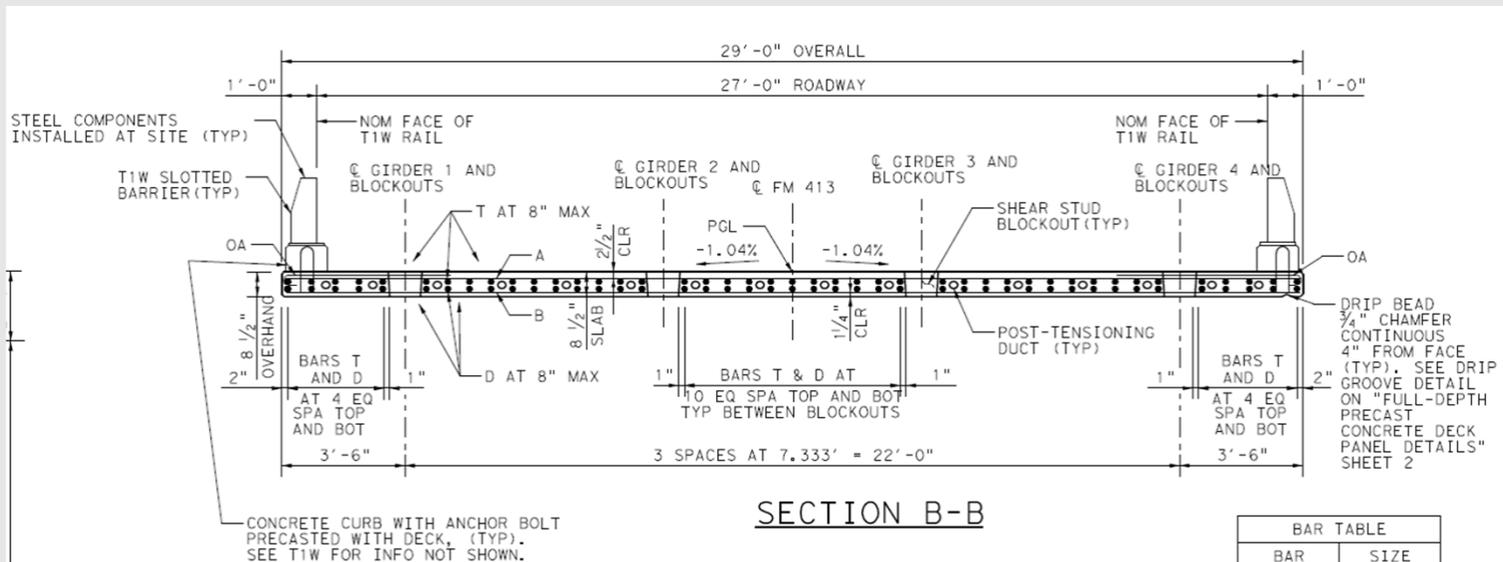
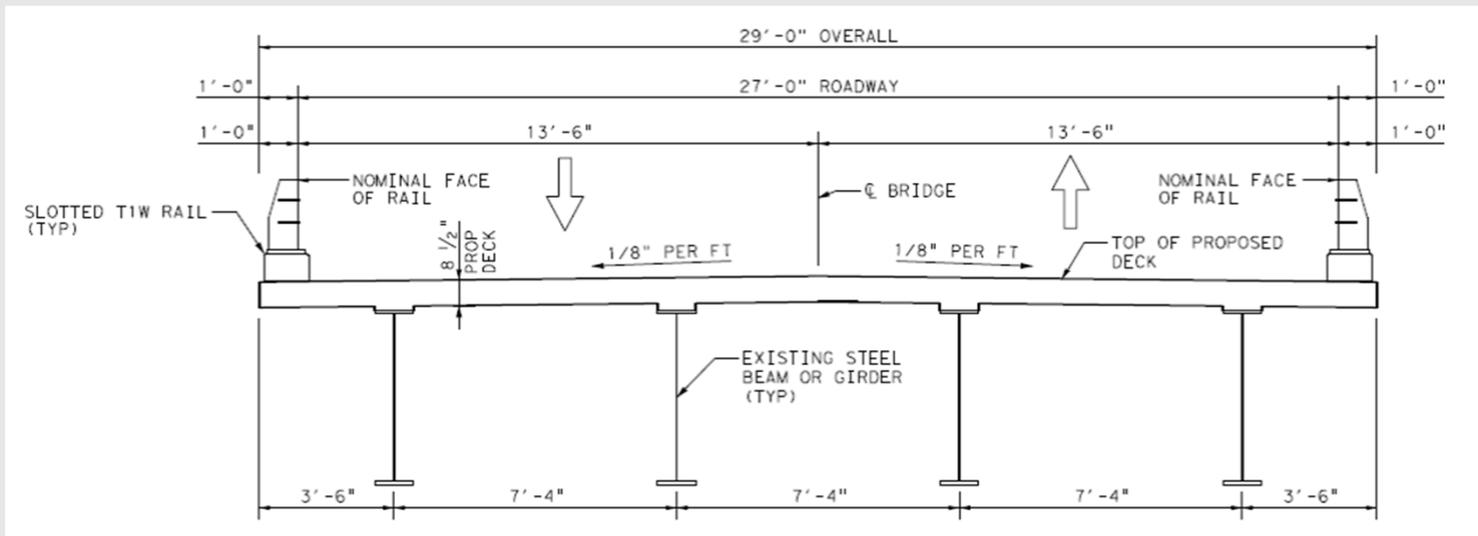
- Projected traffic closure was 150 days.
- Finished 26 days ahead of schedule.



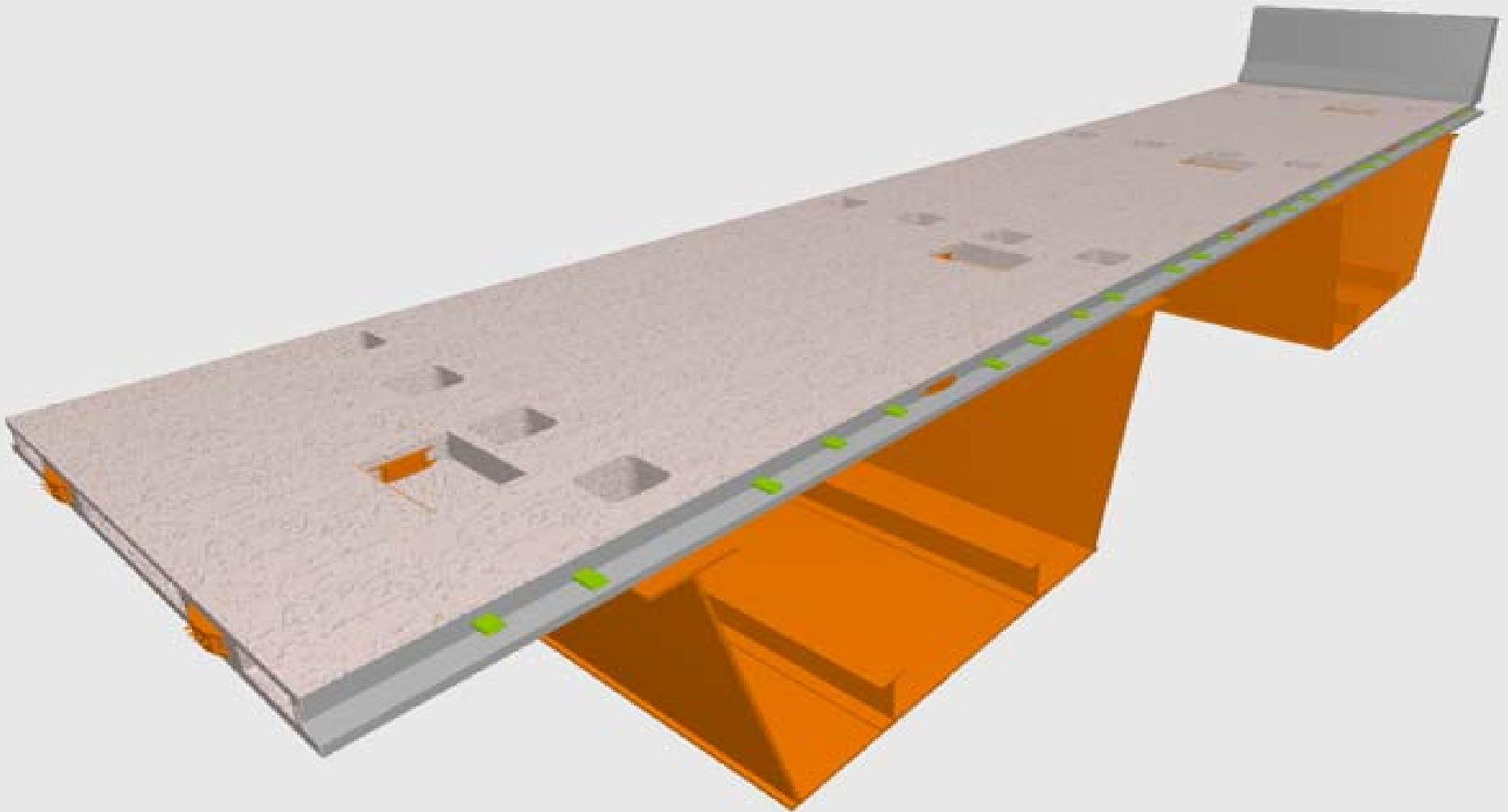
Full Width, Full Depth Panels



Full Width, Full Depth Panels



Full Width, Full Depth Panels



Lateral Slide-in



Photo Courtesy of FHWA

Lateral Slide-in



Photo Courtesy of FHWA

Lateral Slide-in



Photo Courtesy of FHWA

Modular Units



Modular Units



Modular Units



Modular Units



I-93 Fast 14 in Boston



I-93 Fast 14 in Boston



New Bearing Seat

Existing Cap

West Dallas St. in Houston



West Dallas St. in Houston



West Dallas St. in Houston





QUESTIONS?

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ACCELERATED CONSTRUCTION STRATEGIES

DESIGN CONSIDERATIONS

Lacey Rodgers, PE, CFM – Dallas District



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Design Considerations

- Minimize Profile change to reduce earthwork.
- Balancing earthwork within the job
- Repeatable features
 - Curb
 - Curb ramp
 - Pavement design
 - Inlet type
- Specify Precast where logical
- Stay Standard



Traffic Control Plan & Contract Time Determination

Traffic Control Plan

- Project location & traffic patterns
- Access needs
- Minimize mobilization/de-mobilization
- Availability of existing pavement for detour
- Long lead items
- Material delivery
- Lane closure restrictions
- Onsite detour options
- Unclear ROW/Utilities

Contract Time Determination

- Realistic time determination
- Long lead items
- Weather
- Lane closure restrictions
- Season-dependent items
 - Vegetative establishment
 - Concrete pours
- Appropriate time of year for letting
- Conduct a CTD meeting with Construction and Area Office

Comprehensive Plan Review

- DSRT (District Safety Review Team)
 - Conceptual TCP roll plots
- Constructability Review
- District wide Plan Review – 30%, 60%, 95%
- General Notes
- Specifications
- Plan Sheet notes



- RCLS – Review Comments Logging System
- Early Contractor involvement
 - FTP/Sharepoint
 - Feedback

Ready to Let (RTL)



- 100% PS&E
 - Free of outstanding comments
- Environmental Clearance
- Right-of-way Clear
- Encroachments Clear
- Relocation Clear
- Utilities Clear
- Rail Road Agreement in Place
- Other Agreements

Delivery Methods

- Design Bid Build
 - Incentive and Disincentive for Milestone Work
 - User Costs and Duration defines value
 - A+B bidding
 - Cost + time bidding
- Design build
 - 2 large projects Horseshoe and Southern Gateway



Incentive/Disincentive for Milestone Work

- Incentive and Disincentive for Milestone Work
 - User Costs and Duration defines value
 - Communicated in TCP & Contract Time Determination

Letting Date	CSJ	Road	Type	Daily RUC	Begins	Ends	Duration
Jun-17	2374-04-049	IH 20	Disincentive	\$3,500.00	When the number of lanes available to traffic on Carrier Parkway is reduced from existing as shown in TCP Phase 4 Stage 1	When all lanes on Carrier Parkway open to traffic and match the final, proposed conditions	293 Days Permitted
May-17	0261-02-074	US 67	Disincentive	\$2,000.00	When the northbound entrance from Belt Line Road closes to traffic as shown in TCP Phase 2 Stage 1	When the northbound entrance from Belt Line Road opens to traffic as shown in TCP Phase 3 Stage 1	Closure Permitted 30 Days
May-17	0261-02-074	US 67	Incentive/Disincentive	\$1,500.00	When the northbound exit to Wheatland Road closes to traffic as shown in TCP Phase 3 Stage 1	When the northbound exit to Wheatland Road opens to traffic as shown in TCP Phase 3 Stage 2	Closure Permitted 75 Days, 30 Days of Incentive Permitted

Incentive/Disincentive for Milestone Work

Letting Date	CSJ	Road	Type	Daily RUC	Begins	Ends	Duration
Jul-16	0095-02-102	US 80	Incentive/Disincentive	\$1,000.00	Commencement of construction work called out in Phase 3 of the Traffic Control Plan	Completion of all work shown in Phase 3 of the Traffic Control Plan and the opening of all travel lanes	126 Days, 30 Days maximum for incentive
Dec-15	0047-14-069	US 75	Incentive/Disincentive	SP Item 000-001	Contract Time Charges Begin	Project is Substantially completed	858 (refer to SP 008-006 for incentive max days)
Dec-15	0047-14-069	US 75	Incentive/Disincentive	\$1,000.00	When traffic on FM 455 is shifted north and barrier is placed, as shown in TCP Phase 1 Stage 1	When construction of the FM 455 bridge over US 75 is completed and traffic on FM 455 is shifted to utilize both sides of the new structure, as shown in TCP Phase 2 Stage 1	208 (refer to SP 008-006 for incentive max days)
Aug-15	0048-04-079	IH 35E	Incentive/Disincentive	\$1,000.00	When the bridge or approach roadways carrying Brookside over IH 35E close to traffic	When the new bridge and approach roadways carrying Brookside over IH 35E open to traffic	Closure Permitted 60 Days, 20 Day of Incentive Permitted

Incentive/Disincentive Success Story: SH 161 (CSJ 2964-01-031)

Limits: From Egyptian Way to Conflans Road

Milestone Incentive / Disincentive – Road user and loss toll revenue costs

- A. Incentive Milestone One - Partial open in both directions from/to limits defined.
 - \$3M - If on or before date (1)
 - ↓ \$40K daily every day after date (1)
 - No Incentive after date (2) specified
- B. Incentive Substantial Completion of Work - Work requiring any closures is complete.
 - \$10M - No Excuse Bonus on or before date (3)
 - ↓ \$200K daily every day after date (3)
 - No Incentive after date (4) specified
- C. Disincentive – Failure to not substantially Complete work on time
 - \$40k daily after date (4)
- D. Liquidated damages – failure to complete work on time.



Challenges

- Design
 - Short completion turn around
 - 2 Hydrologic reports & CDC for FEMA Zone AE
 - Project limits changed (lengthened) during design
- Construction
 - Landfill
 - Poor soils
 - Pressure to open for Superbowl XLV February 6, 2011

Successes

- Design
 - Utilizing consultants to bridge gaps & SME in design
 - Regular communication with City of Grand Prairie
 - TCP & Intermediate striping
 - Quality Plans
- Construction
 - Pre – Bid meeting
 - Quality Plans
 - Clear Contract time Determination
 - Clear defined Special Provision
 - Incentive/disincentive/liquidated damages
 - Good Construction team
 - Achieved an open to traffic for Super Bowl XLV February 6, 2011

Cost + Time Bidding (A+B Bidding)

- A combination criteria for selecting the winning bid for a construction project
 - A: Traditional cost bid
 - B: Bid Days = (Contract Duration)
 - Contract duration (or substantial completion)
 - Milestone duration
 - Combination
- $A + (B \times \text{daily road-users cost}) = \text{Bid value}$
- Bid Awarded to the Lowest bid value

Bidder	Bid Amount (A)	Bid Days (B)	Daily RUC	Bid Value (A+B)
A	\$20,300,000	230	\$50,000	\$31,800,000
B	\$20,450,000	220	\$50,000	\$31,450,000
C	\$21,700,000	200	\$50,000	\$31,700,000

Benefits of A+B Bidding

- Competitive bidding yields optimization of cost + time savings
 - Not just the lowest cost or the shortest time
- Generally the winning bid saves both time and cost over the Engineer's estimate
 - Daily RUC value impacts schedule and cost bids
- Encourages potential bidders to develop carefully developed plans
 - Owner benefits from time and/or cost savings



Summary of Dallas District A+B Projects

Summary - DAL A+B Projects (2013~2016)						Eng. Estimate			Winning Bid			
Letting Year	County	Job #	CCSJ #	Daily RUC \$	# of Bids	A (Bid Items \$)	Time Estimate (Days)	B (Days x DRUC \$)	A (Bid Items \$)	% O/U (A)	Time Estimate (Days)	% O/U (B)
May. 2013	Denton	3201	2054-02-016	\$2,590	12	\$23,735,281	506 Days	\$1,310,540	\$23,602,199	-1%	416 Days	-18%
Jul. 2013	Dallas	3212	0092-07-045	\$1,000	2	\$281,696	35 Days	\$35,000	\$448,138	59%	35 Days	0%
Jan. 2017	Ellis	3002	0172-08-053	\$3,300	7	\$71,229,336	730 Days	\$2,409,000	\$61,704,500	-13%	687 Days	-6%
May. 2017	Dallas	3004	0261-02-074	\$20,000	11	\$59,686,407	702 Days	\$14,040,000	\$59,011,998	-1%	468 Days	-33%
Jun. 2017	Dallas	3001	0196-03-268	\$50,000	5	\$72,032,008	780 Days	\$39,000,000	\$78,786,039	9%	618 Days	-14%

- For 3 out of 5 contracts, the “A” part of the bid was under the Engineer’s cost estimate
- For 4 out of 5 contracts, the “B” part was under the Engineer’s duration estimate
- The winning bid for 0196-03-268 had the second lowest “A” bid

Thank You!

For more information, please feel free to contact:

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Thanks to Rene Garcia and Suja Mathew for assistance in slide content.



ACCELERATED CONSTRUCTION STRATEGIES

TRAFFIC AND SAFETY



Traffic and Safety Considerations- Lane Rental Fees for Lane Closures

- Lane rental fees and liquidated damages for lane closures
- Primarily used on our Design-Build projects, but are also used on our larger Design-Bid-Build projects with freeway lane closures.
- Time periods established in the contract for various volumes of traffic
 - Time Period A = peak hour/highest volume of traffic
 - Time Period B = not peak hour but heavier volumes than overnight hours
 - Time Period C/D = lowest traffic volumes (typically overnight)

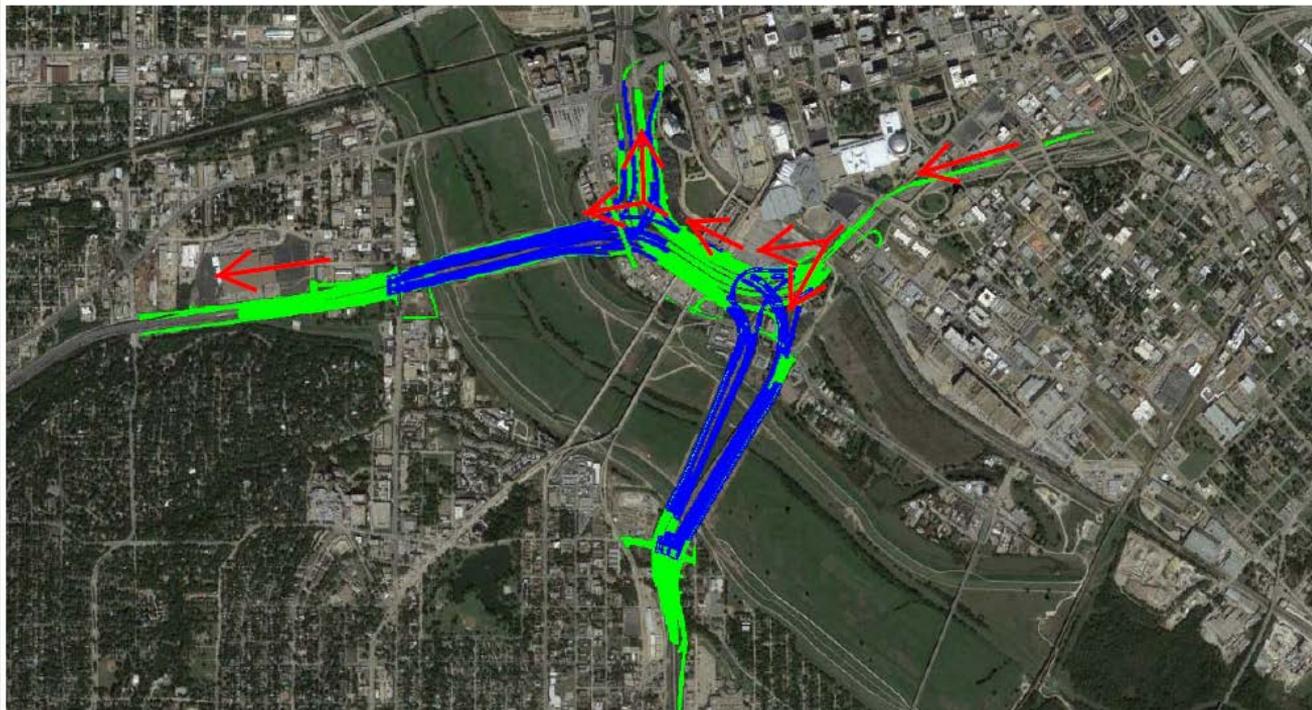
Traffic and Safety Considerations- Lane Rental Fees for Lane Closures

- \$\$ values are assigned for each time period based on the number of lanes closed
 - Lane rental fee bank balance is established in the contract in which lane closure fees are deducted from the bank balance.
 - Lane closures beyond the bank balance are deducted from the monthly estimate.
 - Time Period A lane closures are not allowed, but a dollar value is assigned in the event that an overnight lane closure is not picked up on time. These do not come out of the bank balance, but are deducted monthly from the estimate.

Traffic and Safety Considerations- Lane Rental Fees for Lane Closures

- Dallas Horseshoe Project- example lane rental fee charges:

Westbound IH 30 Lane Fees/Liquidated Damages

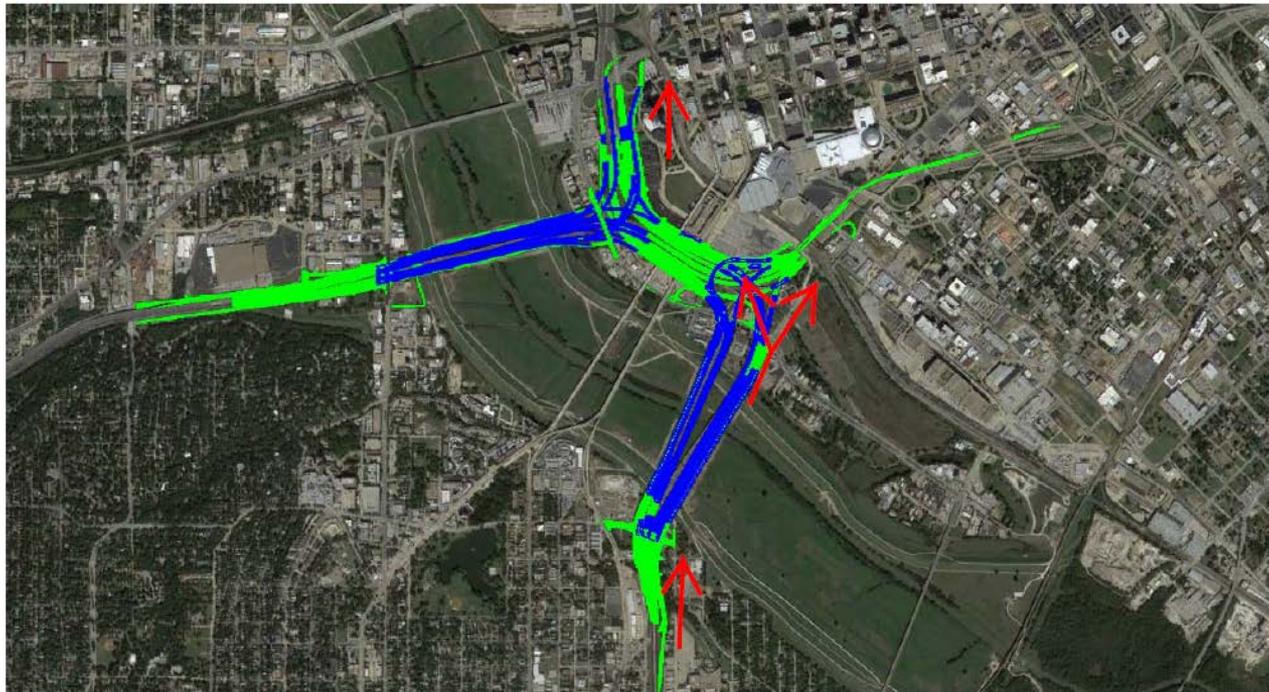


Westbound IH30 East of Mixmaster					
Hour		Sun.	M. - T.	Fri.	Sat.
0:00	12am	C	C	C	C
1:00	1am	C	C	C	C
2:00	2am	C	C	C	C
3:00	3am	C	C	C	C
4:00	4am	C	C	C	C
5:00	5am	C	B	B	C
6:00	6am	C	A	A	C
7:00	7am	C	A	A	C
8:00	8am	C	A	A	B
9:00	9am	B	A	A	B
10:00	10am	B	A	A	B
11:00	11am	B	A	A	B
12:00	12pm	B	A	A	B
13:00	1pm	B	A	A	B
14:00	2pm	B	A	A	B
15:00	3pm	B	A	A	B
16:00	4pm	B	A	A	B
17:00	5pm	B	A	A	B
18:00	6pm	B	A	A	B
19:00	7pm	B	A	A	B
20:00	8pm	B	B	A	C
21:00	9pm	B	B	B	C
22:00	10pm	B	C	B	C
23:00	11pm	B	C	C	C
Lane Fees & Liquidated Damages					
		A	B	C	
	One Lane	\$10,096	\$1,010	\$50	
	Two Lane	\$20,193	\$10,096	\$505	
	Three - Full	\$50,482	\$25,241	\$5,048	

Traffic and Safety Considerations- Lane Rental Fees for Lane Closures

- Dallas Horseshoe Project- example lane rental fee charges:

Northbound IH 35E Lane Fees/Liquidated Damages



Northbound IH 35E (Mixmaster-2 Lane Section)					
Hour	Sun.	M. - T.	Fri.	Sat.	
0:00	12am	D	D	D	C
1:00	1am	D	D	D	D
2:00	2am	D	D	D	D
3:00	3am	D	D	D	D
4:00	4am	D	D	D	D
5:00	5am	D	B	B	D
6:00	6am	D	A	A	C
7:00	7am	C	A	A	B
8:00	8am	C	A	A	B
9:00	9am	C	A	A	B
10:00	10am	B	B	B	B
11:00	11am	B	B	B	B
12:00	12pm	B	B	B	B
13:00	1pm	B	B	B	B
14:00	2pm	B	B	B	B
15:00	3pm	B	B	B	B
16:00	4pm	B	A	A	B
17:00	5pm	B	A	A	B
18:00	6pm	B	A	A	B
19:00	7pm	B	B	B	B
20:00	8pm	C	B	B	B
21:00	9pm	C	C	B	B
22:00	10pm	C	C	C	B
23:00	11pm	D	C	C	C
Lane Fees & Liquidated Damages					
	A	B	C	D	
One Lane	\$50,482	\$10,096	\$202	\$50	
Two- Full	\$100,964	\$50,482	\$5,048	\$2,019	

Traffic and Safety Considerations- Lane Rental Fees for Lane Closures

- Dallas Horseshoe Project- example lane rental fee charges:
 - Full westbound I-30 closure from 11pm Friday to 8am Saturday:
 - 9 hours of Time Period C
 - $9 \times \$5,048 = \$45,432$
 - Full northbound I-35E closure from 10pm Friday to 6am Saturday:
 - 3 hours of Time Period C
 - 5 hours of Time Period D
 - $(3 \times \$5,048) + (5 \times \$2,019) = \$25,239$
 - Total lane rental fees deducted from the bank balance = \$70,671

Traffic and Safety Considerations- Lane Rental Fees for Lane Closures

- Dallas Horseshoe Project- example lane rental fee charges:
 - Work Completed that evening:
 - Set 7 Tx62 girders over westbound I-30 on Bridge 45
 - Set 8 Tx62 girders over northbound I-35E on Bridge 10
 - Placed temporary shoring and work platform for Houston Street arches, decking, and railing
 - Removed bridge overhangs for completed Jefferson Street railing.
 - Removed existing high mast illumination pole
 - Placed 1000 lf of portable concrete barrier

Traffic and Safety Considerations- Lane Rental Fees for Lane Closures

- Dallas Horseshoe Project- example lane rental fee charges:
 - Work Completed that evening:



Traffic and Safety Considerations- Lane Rental Fees for Lane Closures

- Dallas Horseshoe Project- example lane rental fee charges:
 - Work Completed that evening:



Traffic and Safety Considerations- Lane Rental Fees for Lane Closures

- Dallas Horseshoe Project- example lane rental fee charges:
 - Work Completed that evening:



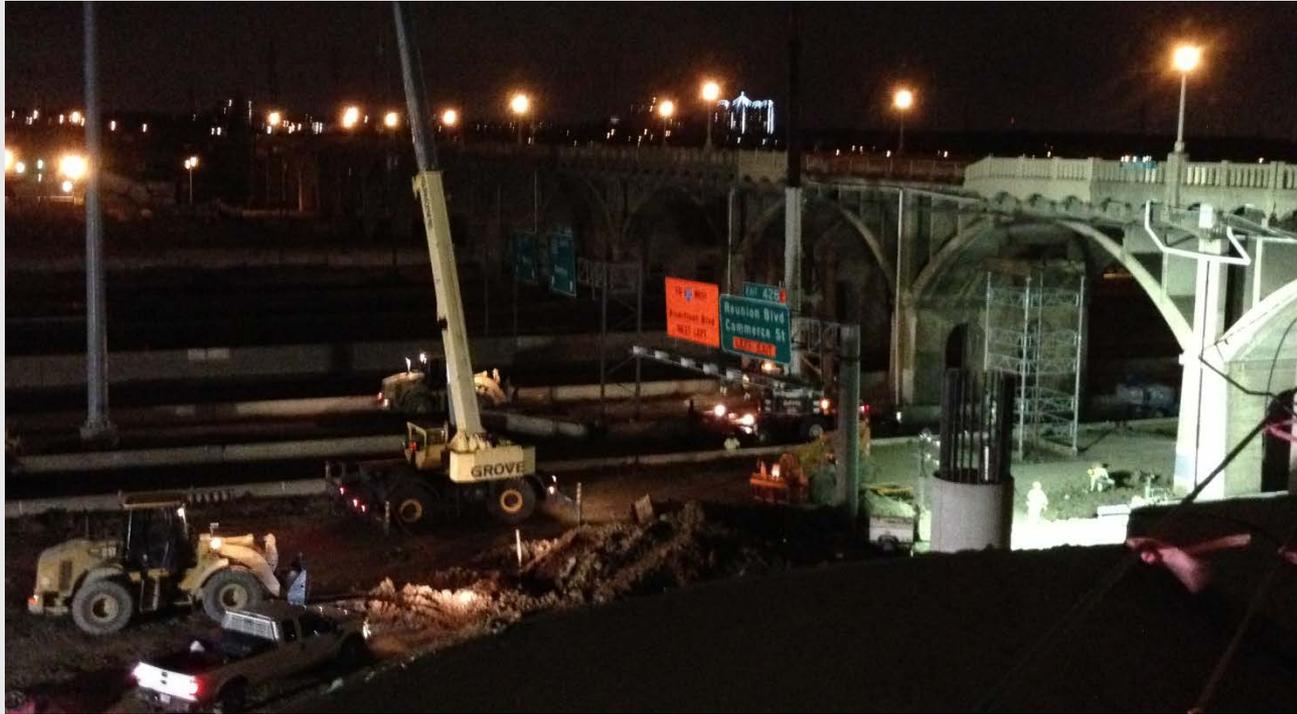
Traffic and Safety Considerations- Lane Rental Fees for Lane Closures

- Dallas Horseshoe Project- example lane rental fee charges:
 - Work Completed that evening:



Traffic and Safety Considerations- Lane Rental Fees for Lane Closures

- Dallas Horseshoe Project- example lane rental fee charges:
 - Work Completed that evening:



Traffic and Safety Considerations- Lane Rental Fees for Lane Closures

- Dallas Horseshoe Project-
 - Lane Rental Fee Bank Balance = \$2.4 million
 - Results:
 - Majority of lane closures were completed overnight, very few single lane closures during the day on the weekend
 - All full closures were completed in overnight hours (majority on Friday and Saturday nights)
 - No full closures needed during the day on the weekend
 - Work during closures was maximized and multiple activities and crews worked safely within the closures.
 - Not a single lane closure was not picked up by Time Period A/the peak hour
 - Overall we believe we have reduced the impact to the traveling public

Traffic and Safety Considerations- Lane Rental Fees for Lane Closures

- Dallas Horseshoe Project-
 - Other closures with multiple crews:



Traffic and Safety Considerations- Lane Rental Fees for Lane Closures

- Dallas Horseshoe Project-
 - Other closures with multiple crews:



Questions



ACCELERATED CONSTRUCTION WORKSHOP

Public Information Best Practices

Tony Hartzel, PIO Supervisor, Dallas District



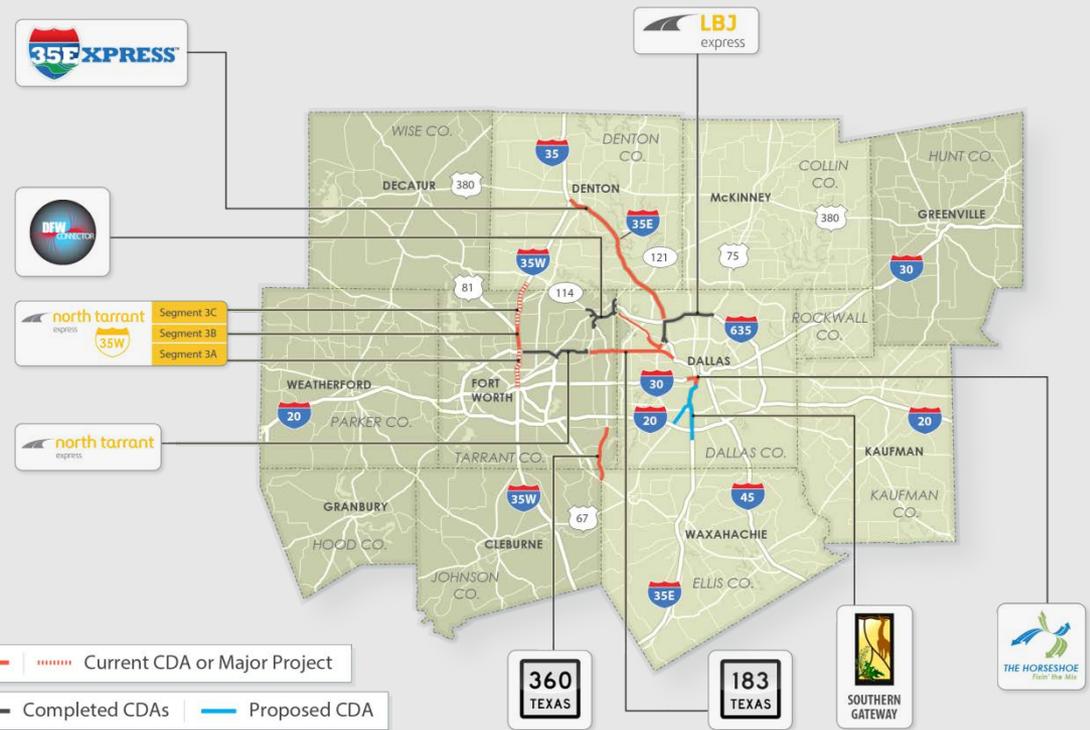
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Outreach Overview

- Major Projects since 2009

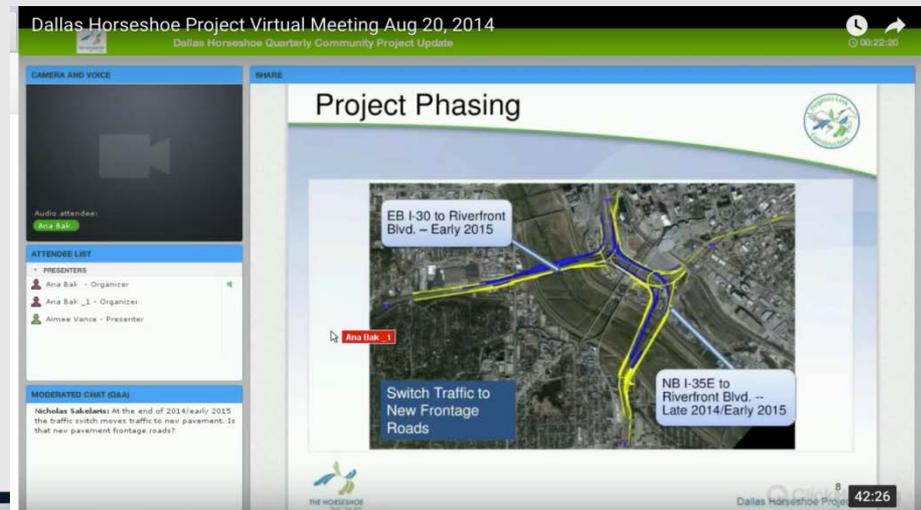
- DFW Connector
- North Tarrant Express
- LBJ Express
- Dallas Horseshoe
- 35Express
- Midtown Express
- Southern Gateway (2018)
- (Others SH 360, 35W Segment 3A)



- Some general rules apply, but constituents and outreach needs vary by corridor
- Best practices have developed over the years -- Social media, project hotlines, project websites and storefronts

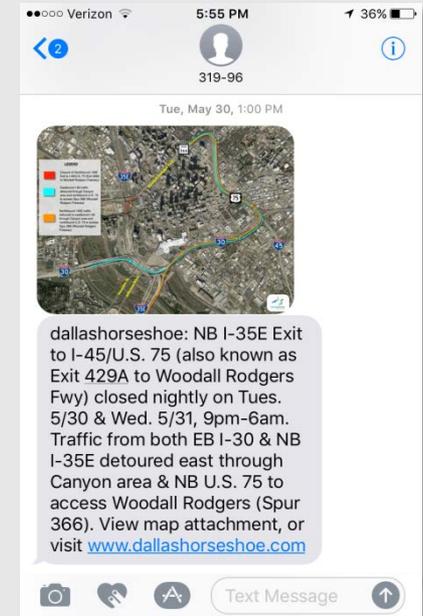
Outreach Highlights – Dallas Horseshoe

- Heart of downtown Dallas
450,000 vehicles per day
- Heavy emphasis on mass messaging
 - Video traffic alerts
 - Quarterly digital newsletter
- Virtual meetings/town halls
 - Promoted via social media
 - Chat online with project managers
 - Small audience, but larger than physical town hall meetings
 - Honorable mention in AASHTO TransComm 2015 competition
 - WTS-DFW Innovative Transportation Solutions Award



Outreach Highlights – Dallas Horseshoe

- Limited demand for direct outreach (town halls, chamber briefings)
- Meet individually with affected property owners during construction phases
- Understand your audience and find ways to get them the information
 - Text alerts – with images
 - Social media
 - Weekly e-blasts with up-to-date lane closure information



Outreach Highlights – DFW Connector/Midtown Express

- Mid-cities major projects
- More residential and small business
- Set the standard for:
 - Website
 - E-alerts
- Business Owner Task Force
 - Give those directly affected a targeted, monthly briefing
 - Unwind the Vine effort
 - Ask questions and provide feedback
 - Buy-in from potential opponents
 - Meetings on Midtown Express moved to various locations to encourage attendance



Eat, Shop, Dine Local – Unwind the Vine

Did you know you can win great prizes just by doing business in your hometown? In an effort to help the businesses in the DFW Connector corridor, the City of Grapevine and the Grapevine Chamber of Commerce have partnered in a program to incentivize local residents to patronize participating businesses. Simply pick up an Unwind the Vine card at a participating business, City Hall or the Chamber of Commerce and take it to any participating business (visit unwindthevine.com for a complete list), have the card stamped, repeat the process 10 times and then leave it in the designated box at the last business you patronize for a drawing at the monthly Grapevine Chamber of



the City of Grapevine and the Grapevine Chamber of Commerce have partnered in a program to incentivize local residents to patronize participating businesses. Simply pick up an Unwind the Vine card at a participating business, City Hall or the Chamber of Commerce and take it to any participating business (visit unwindthevine.com for a complete list), have the card stamped, repeat the process 10 times and then leave it in the designated box at the last business you patronize for a drawing at the monthly Grapevine Chamber of



Angelina Knight (L) won a \$500 gift certificate to Blagg Tire & Service

June 2, 2017

WEEKLY LANE CLOSURE LOOK AHEAD

The information below is an overview of some of the major upcoming pieces of work. For a complete list of closures and traffic switches, please visit the [lane closures page](#) on our website. Please remember all closures are subject to change and weather dependent.

EULESS CLOSURES

EULESS MAINLANES AND RAMP

Eastbound SH 183 under Main St. moves to a new traffic pattern.
Dates and Time: 9PM on 6AM on 6/2

Westbound SH 183 on-ramp at Main St. moves to a new traffic pattern. The on-ramp will be closed overnight.
Dates and Times: 9PM to 6AM each night on 6/2-6/3

Eastbound SH 183 on-ramp at Bear Creek closed nightly.
Dates and Times: 9PM on 6AM each night on 6/2-6/19

Westbound SH 183 on-ramp at Bear Creek closed nightly.
Dates and Times: 9PM on 6AM each night on 6/2-6/19

Nightly double left lane closures on east and westbound SH 183 from Ector Dr. to Main St.
Dates and Time: 9PM to 6AM each night on 6/5-6/9 & 6/12

Westbound SH 183 under Main St. moves to a new traffic pattern.
Dates and Times: 9PM on 6AM on 6/6

Intermittent 15 minutes closures of east and westbound SH 183 at Ector Dr. throughout the night.
Dates and Time: 10PM to on 6AM on 6/8

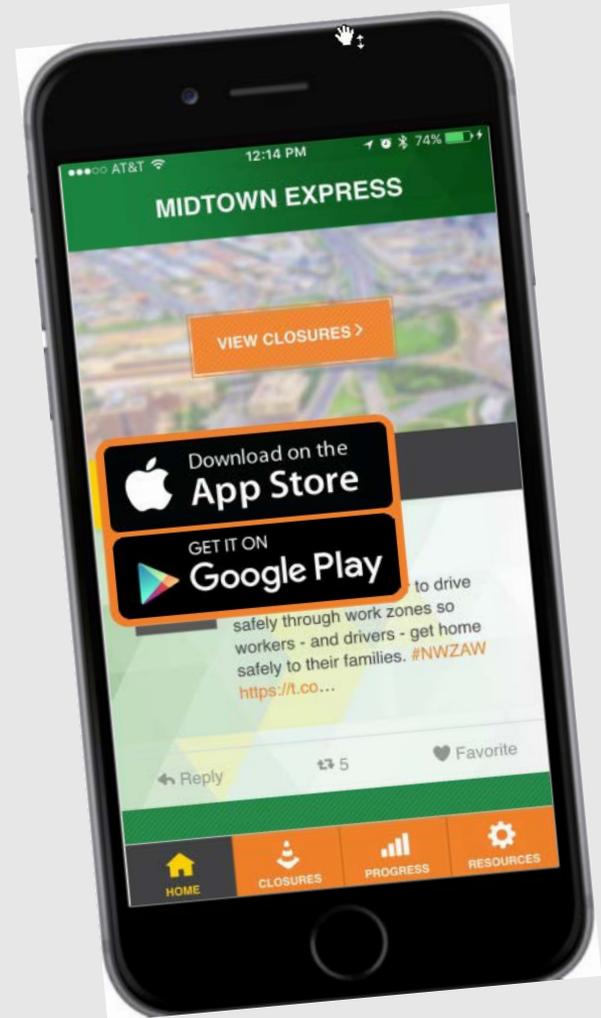
FULL WEEKEND CLOSURE

Westbound SH 183 off-ramp to Main St. closed. Westbound SH 183 frontage road at Bear Creek Parkway closed at the same time.
Dates and Times: 9PM on 6/9 to 6AM on 6/12



Outreach Highlights – DFW Connector/Midtown Express

- TxDOT's first-ever mobile app (DFW Connector)
 - More than 10,000 downloads on DFW Connector app
 - Real-time push notifications
 - Real-time Google map updates showing corridor conditions
 - List of current closures and project updates
- Pace of construction requires constant updates
- Open houses for community fosters trust and support
- Attendance at community events
- Always adapt
 - Lane closure notifications modified over time
 - Text alerts for major incidents
 - Storefront hours



Outreach Highlights – 35Express

- 30 miles from Dallas to Denton
- Nine cities and two counties
 - Greater need for targeted, direct stakeholder outreach
 - What happens in Denton does not necessarily affect Dallas commuters
- Project divided into three segments
 - Outreach tailored to those geographic areas
 - Intense effort at outset created strong relationships with local leaders
 - Quarterly project update/community meetings
- Meet directly with cities and counties
 - Regular briefings at council meetings
 - Regular briefings with first responders
 - Monthly, city-specific updates provided to city councils



Outreach Highlights – 35Express

- Award-winning website and outreach
 - American Road and Transportation Builders Association Pride Award
- Barrel monsters effort generated positive coverage
- #SafeDrive35 social media campaign
- Challenges due to project phasing
 - AGL nearing completion on Phase 1, TxDOT will construct Phase 2, date TBD
 - Stay in your lane, answer your questions or get someone from the other team to answer



Outreach Highlights – Other Projects

- LBJ Express
 - LBJ Marketplace, targeted business retention effort
 - First project to attempt electronic town hall
 - Extensive use of text traffic alerts
- North Tarrant Express
 - Two projects: SH 183/I-820 and I-35W (ongoing)
 - Six cities on initial project
 - One-on-one, targeted communications worked best
 - Less focus on community events and open houses



Summary of Tools in the Box – Tray 1

- Public Project Storefronts
- Websites
- Press Releases
- Dedicated Hotline Telephone Numbers
- Email and Telephone Responses to Public Concerns, Complaints, Comments, and Praise
- Email Subscription to Lane Closures, Incident Notification and Project Updates
- Text Alerts for Lane Closures and Major Incidents
- Social Media (Facebook, Twitter) for Lane Closures and Incident Notification
- Detour Maps/Aerial Photographs/Visualizations

Summary of Tools in the Box – Tray 2

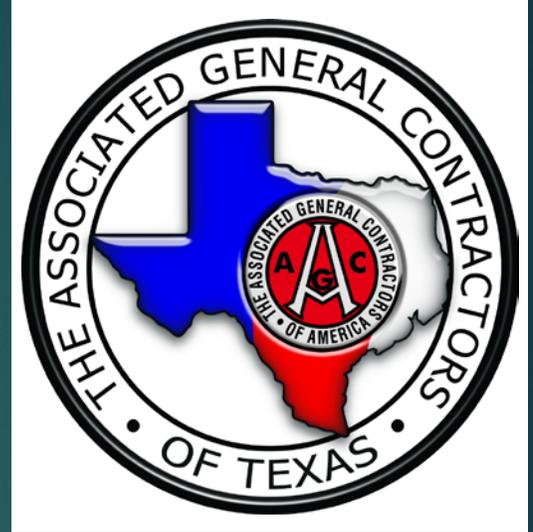
- Smartphone Apps
- Newsletters and Project Trackers
- Business Owner Task Force Meetings
- Virtual Meetings/Town Halls/Open Houses
- Personal Meetings with City Elected Officials and Staff
- Personal Meetings with Adjacent and Affected Businesses
- Presentations to Local Community Groups
- Participation in Community Fairs and Festivals
- Coordination with PIO Staff at Sister Entities

Lessons Learned

- Be adaptable
 - Outreach practices can vary by project
 - Find what works for your stakeholders
- Compressed review times for materials
- Major projects are a laboratory for outreach methods
- TxDOT PIO assigned to each project
 - Meets weekly or more frequently as needed
 - Communications team approach
- Don't forget about the technical provisions
 - Update TPs after every project
 - Build upon past history

Accelerated Construction Workshop

PHILLIPPE FALKNER – ED BELL CONSTRUCTION



Roads – Faster! Like this right???



There's no magic wand or silver bullet

- ▶ It's about reducing critical path activities.
- ▶ It's about keeping utility delays out of your schedule.
- ▶ It's about simplifying the design.
- ▶ It's about seeing the bigger picture.
- ▶ It's about avoiding red tape.
- ▶ It's about checking your ego at the door.
- ▶ It's about being proactive instead of reactive.
- ▶ It's about keeping an open mind. It can be done. We've done it and lived to tell the tale.

Three approaches for success

- ▶ Design and Construction methods
- ▶ Rules and Regulations
- ▶ Partnering and Project Delivery

Design and Construction Methods



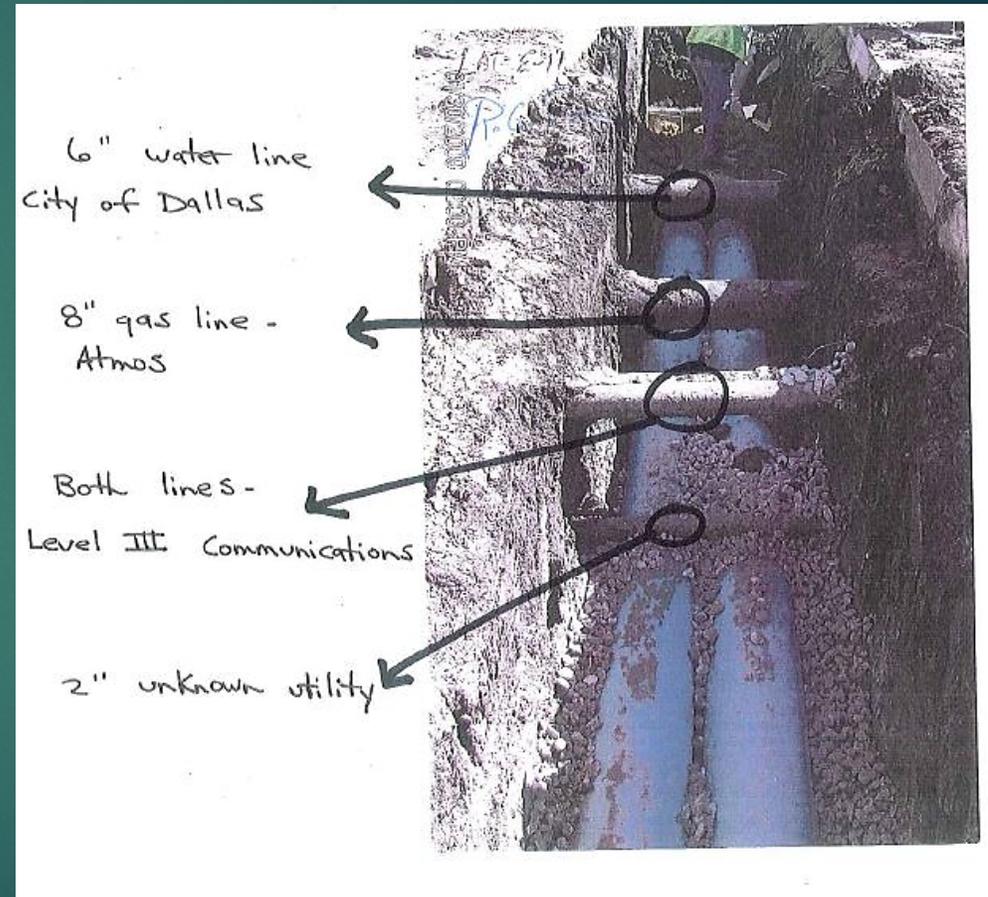
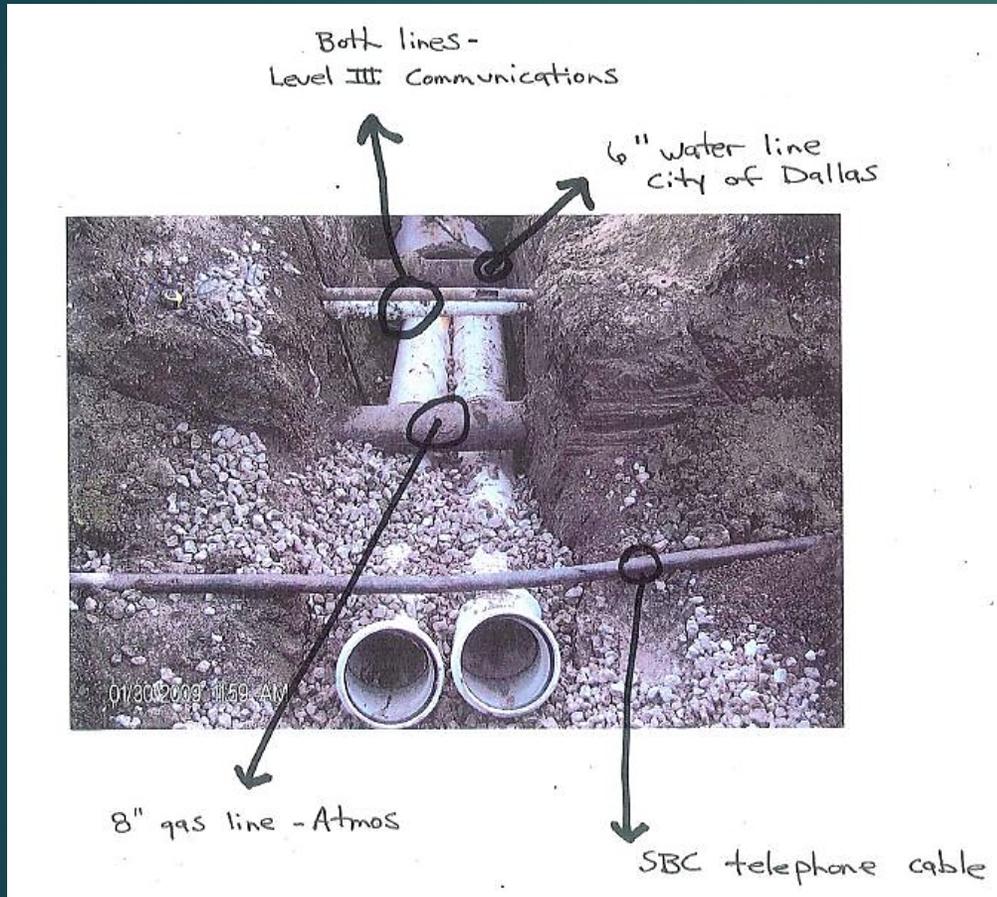
Accelerating key phases or intersections: weekends work

- ▶ Be prepared before you get to the need to do it. Have alternate subgrade designs, pricing, and mechanisms in place to use on the fly. Much better to bid it in than change order it in.
- ▶ Even if a project section is designed with lime or cement, consider flexible base for subgrade...or no subgrade at all.
- ▶ HES concrete is underutilized. It's not just for concrete paving. Inlet throats, flowable fill with accelerator in lieu of CSB at abutments, just about any non-HPC concrete is an option.
- ▶ Maturity meters are a vastly underutilized tool.

Avoid utility delays when possible...and probable

- ▶ The Department in conjunction with the contractor can ALWAYS move faster than a franchise utility...if they are willing to do so.
- ▶ Don't be afraid to think WAY out of the box on rerouting foundations, structures, utilities, etc. Additional construction costs are almost always cheaper than utility delay claims, plus added time for the public.
- ▶ Quit asking "Do we have a pay item?" or "What is the standard?". Start asking "What will solve the problem?" and "What will work?"
- ▶ On a project in Dallas County (with 31 separate franchise utilities), contractor field fit drainage laterals on a daily basis under force account, under supervision from an engineer, to progress laterals around live utilities.

Hampton/Inwood Road



Simpler designs = faster construction

- ▶ Curb and Gutter templates should rest on the subgrade, with an adjacent section of HMAC. Avoid placing HMAC under AND adjacent to a curb and gutter section. This generates a second HMAC mobilization.
- ▶ Try to avoid using multiple types or classes of HMAC in a section. Most vendors only run one type of mix in a silo per day. Slows down production rates.
- ▶ Think about roadway geometry, especially as it relates to structures. Just because it can be done, is it necessary? Will it add additional low production work, especially in the superstructure? Does it add falsework or additional critical path activities, like haunch build up?
- ▶ Use of common paving widths where possible. Reduce the need for machine and formwork changes. Make the process repeatable.
- ▶ Bridge rail: stick to what can be slip formed, gets done in less than 20% of the time.

Sometimes, it's about getting out the checkbook....

- ▶ Sometimes it makes sense to pay for all the PCTB upfront, to work in all available areas.
- ▶ Utilize available PCTB types, understand fabrication times and limited vendors.
- ▶ Stamped traffic control plans : figure out who can do them quicker, and don't be married to either party doing them. It's about keeping the project moving.
- ▶ Certain types of shoring open new and available work areas in an instant.
- ▶ Pay for sod. Yes, pay for sod.

You cannot sacrifice safety or quality for speed

- ▶ Accelerated bridge deck riding surfaces. Is it worth getting a decrease in ride quality?
- ▶ Trying to work multiple crews in limited workspaces. Don't believe the "project manager misnomer" : nine women together can make a baby in one month.
- ▶ At some point, men and machines only go so fast.
- ▶ Some things should be limited to emergency construction only.

Regulations and Rules



Don't handcuff yourself intentionally

- ▶ The spec book is a guide in combination with common sense and design parameters.
- ▶ See the forest AND the trees. Look for opportunity, don't be scared by the perception of "regulations and protocol."
- ▶ Avoid the crutch of "Build it per plan."
- ▶ Build flexibility into all aspects of your plan. Set the Engineer and contractor up for success later. You can always put in options, then not use them.

When is it time to rip the band-aid off?

- ▶ What do 9A-330P closure restriction really get the traveling public? How do we get anything done on the critical path in 5 ½ hours per shift?
- ▶ Twice the pain in less than half the time; the traveling public is equally unhappy.
- ▶ Understand fixed times (lane closure setups, equipment setups). Find ways to increase production times.

Partnering and Project Delivery



It takes effort and “want to”

- ▶ Empower personnel to make field level decisions.
- ▶ Stop with “We have #X days to review.” If it helps the project, walk it through and expedite. Take the active role.
- ▶ Don’t plan for IF something goes wrong, but rather WHEN something goes wrong.
- ▶ It may be a last minute idea, doesn’t mean it’s too late.
- ▶ Work towards helping the contractors be successful. This isn’t a puzzle.
- ▶ Neither side should have surprises waiting for them.
- ▶ “Bid as shown” before the letting – change order and delay after it.

Understand what tools you have in your toolbox

- ▶ Use of incentives and disincentives; it works better with more carrot and less stick.
- ▶ No excuse incentives – have your ducks in a row.
- ▶ Time determination calculations. Is the foundation you're building on solid? What are we trying to accelerate? You can't defy logic.
- ▶ Make a clean path for value engineering and time savings proposals. Discuss at the pre-con.
- ▶ Understand your bid items and the proper application of them.

Real world concerns

- ▶ Reduction of aesthetics, landscaping, form liner, bridge rail, etc.
- ▶ Prop 1/7 and the promise to the taxpayer. 80%+ of the voters didn't support more funding for aesthetics. Even if third party pays – it still slows down the project.
- ▶ Understanding the workforce challenges and shortfalls, you're not going to cut 50% out of project time in the current environment. One project gains – another project suffers.
- ▶ Accelerating time too much limits competition and success ratio.
- ▶ Accelerate key projects wisely. If you accelerate every project, you've accelerated none of them.
- ▶ Gains of 10-25% are realistic.

Project Delivery

- ▶ Project delivery task force goals are hand in hand with accelerated construction goals.
- ▶ High levels of open and productive communication.
- ▶ Setting realistic goals and expectations.
- ▶ All project team members have to be pulling the cart in the same direction.

Thanks

- ▶ TxDOT : Randy Hopmann, Tracy Cain, D/FW District Engineers, Area Engineers, and staff.
- ▶ TTI : Jon Epps
- ▶ AGC of Texas : Thomas Bohuslav
- ▶ Contracting community

District Workshops on Accelerated Construction Regional Workshop Exercises

AC-PP-17-11

David Newcomb

Dallas/Fort Worth/Waco

Westin DFW

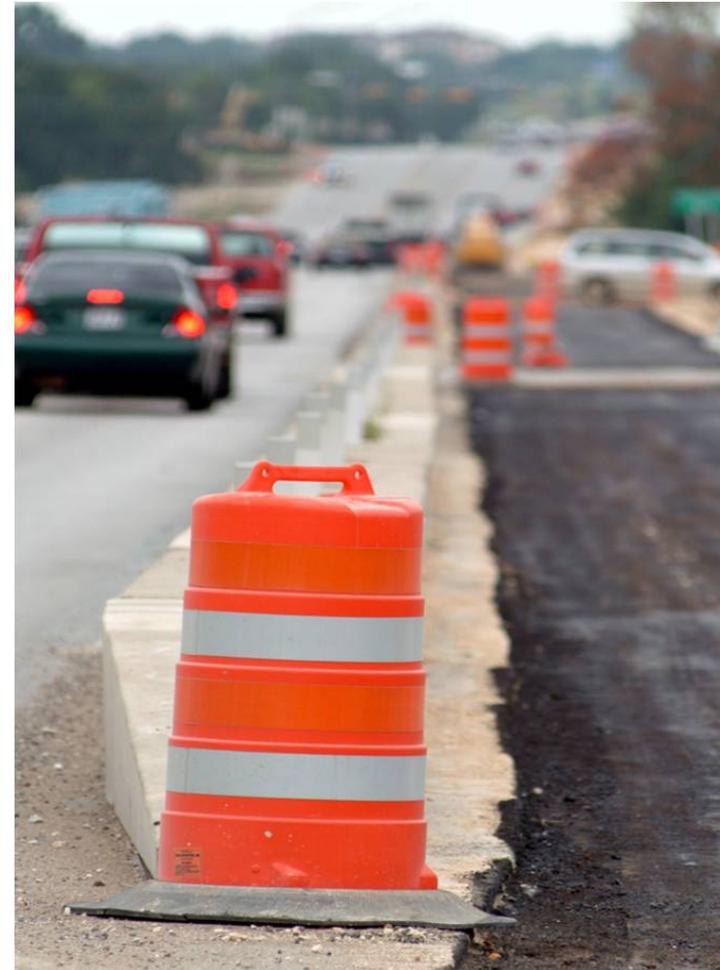
June 13, 2017



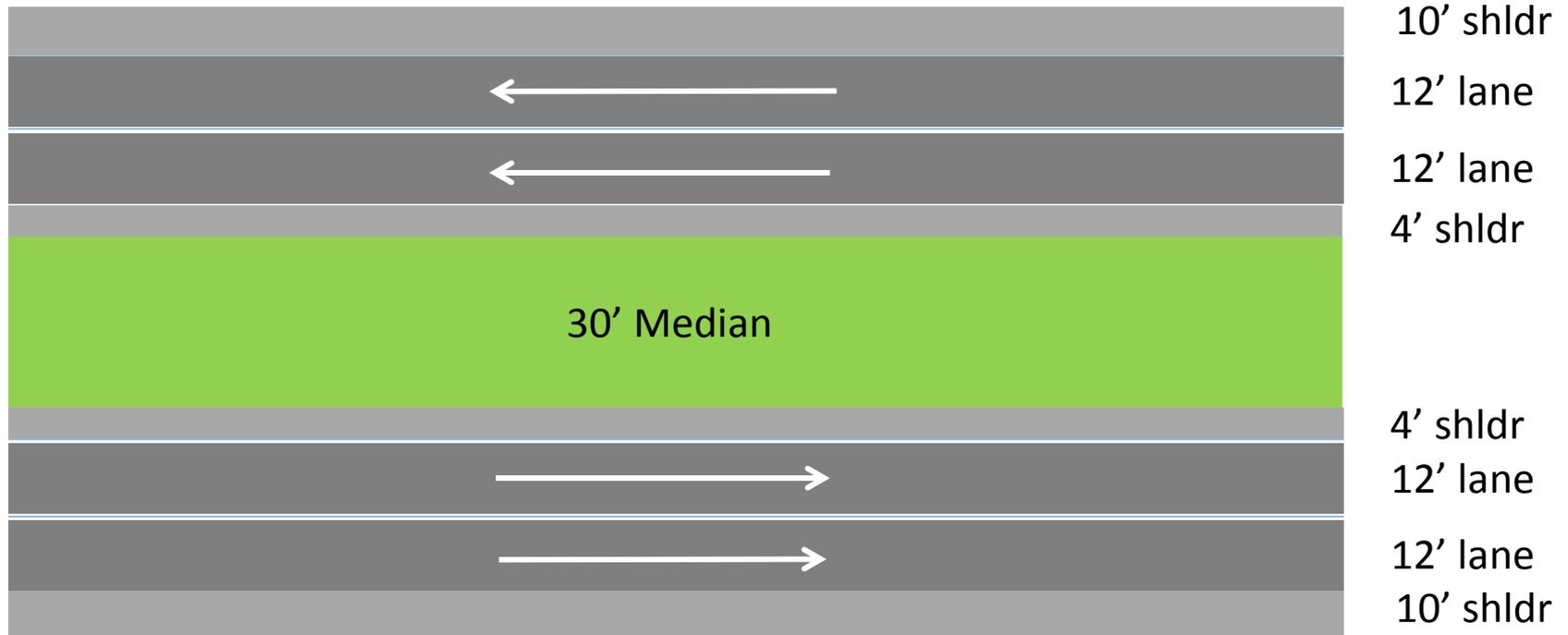
Typical Projects



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



Exercise A: Pavement Strengthening



Project Details:

Work

Project length: 3 miles

11" asphalt, mill 3"

Replace with 4" AC or 6" PCC

Shoulders to match

Soil is expansive clay

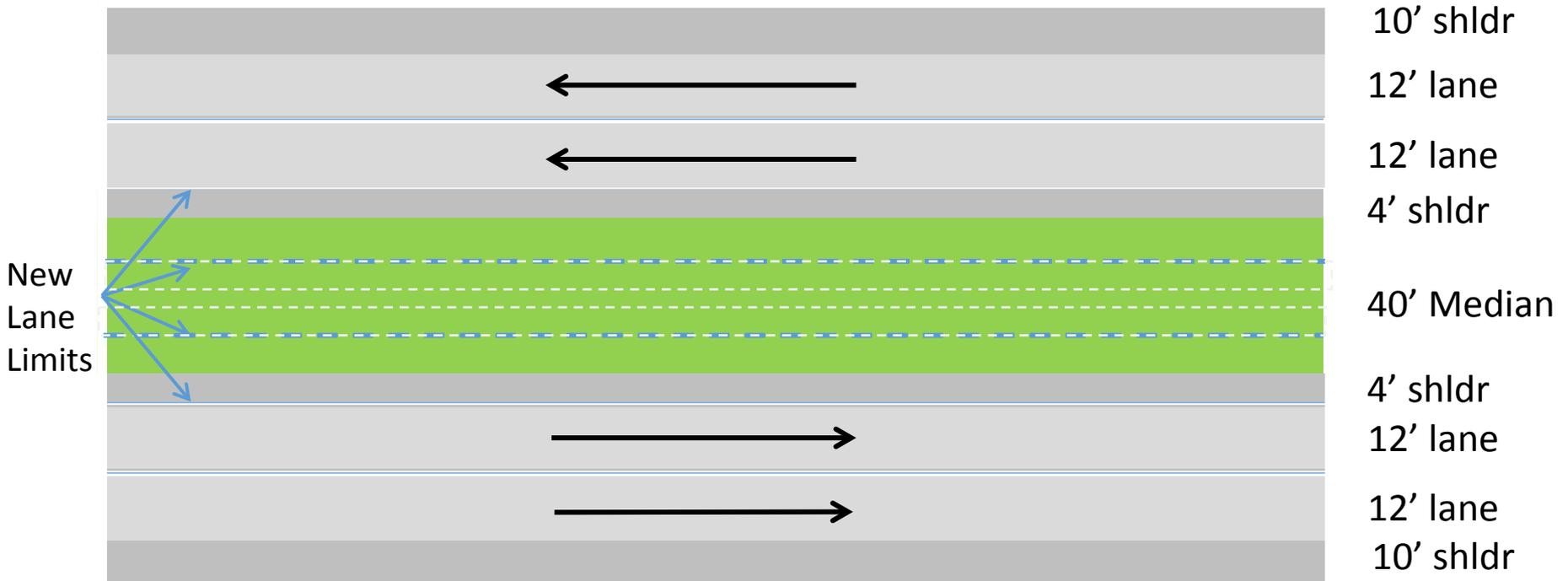
Traffic

AADT = 48,000

Peak: M-F 6:30 am to 9:00 am and 4:00 pm to 6:30 pm

Possible Detours: Frontage road, busy downtown on weekends, ramps @ 1 mile interval

Exercise B: Pavement Widening



Project Details:

Work

Project length: 3 miles

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 is expansive clay

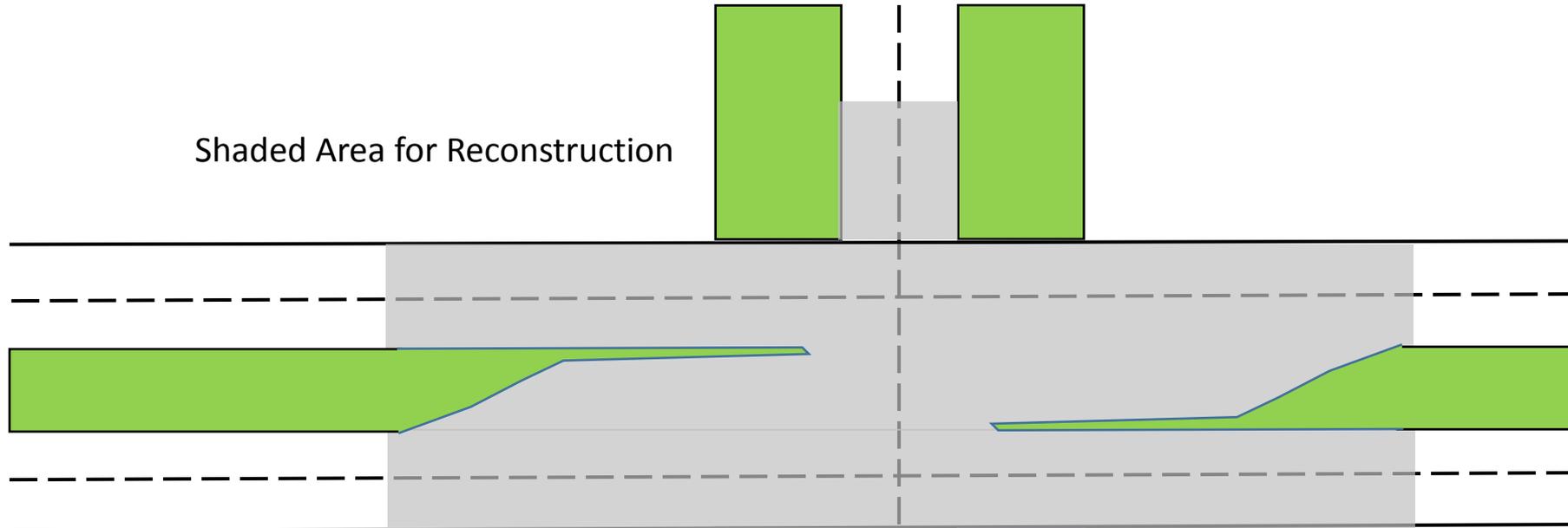
Traffic

AADT = 50,000

Peak: M-F 6:00 am to 8:30 am and 5:00 pm to 7:30 pm, wkend heavy not congested

Possible Detours: Frontage road requires strengthening, ramps @ 1.5 mile interval

Exercise C: Rural Intersection Reconstruction



Project Details:

Work

Project: Shaded Area

Exist: 4" AC/6" Flex Base

Fix: 8" AC or PCC/remaining material

Soil is silty sand

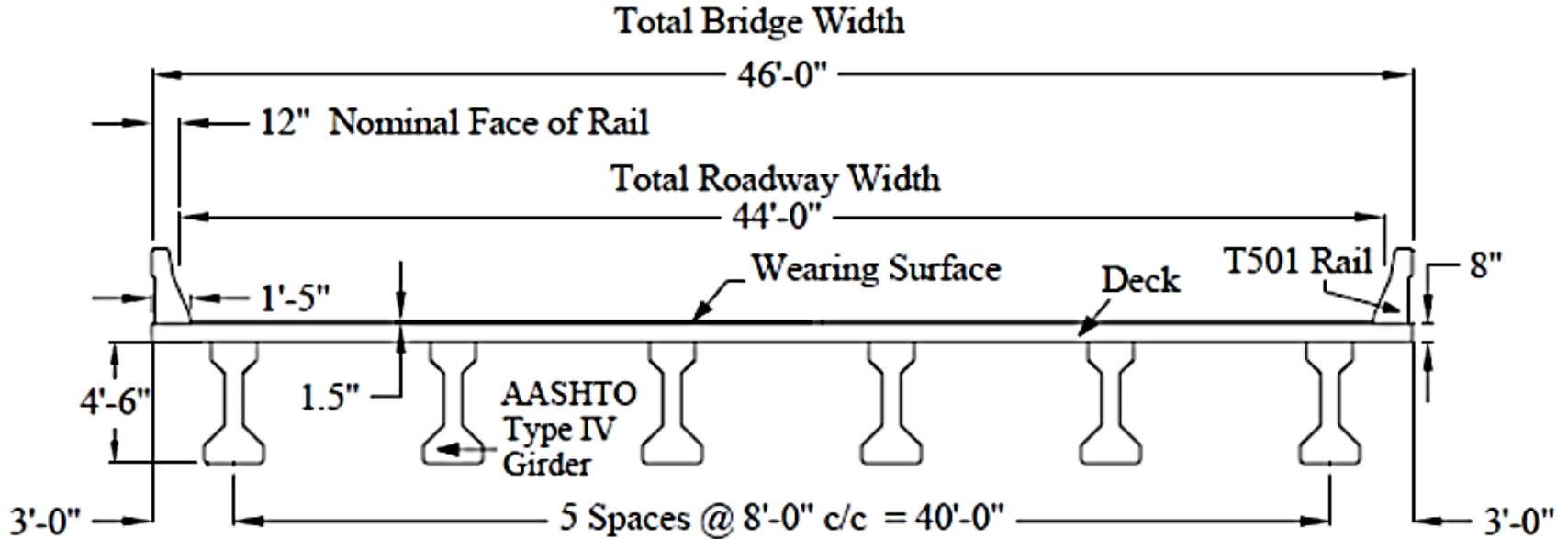
Traffic

AADT = 20,000 for 4-lane; 5,000 for 2-lane

Peak: M-F 6:30 am to 7:30 am and 6:00 pm to 7:30 pm, wkend heavy traffic to recreational lake on 2-lane with increased turns

Possible Detours: Result in additional 15 miles

Exercise D: Standard Bridge Overpasses – Widening Medium Span Bridges and Solutions for Replacing Short- and Medium-Span Bridges



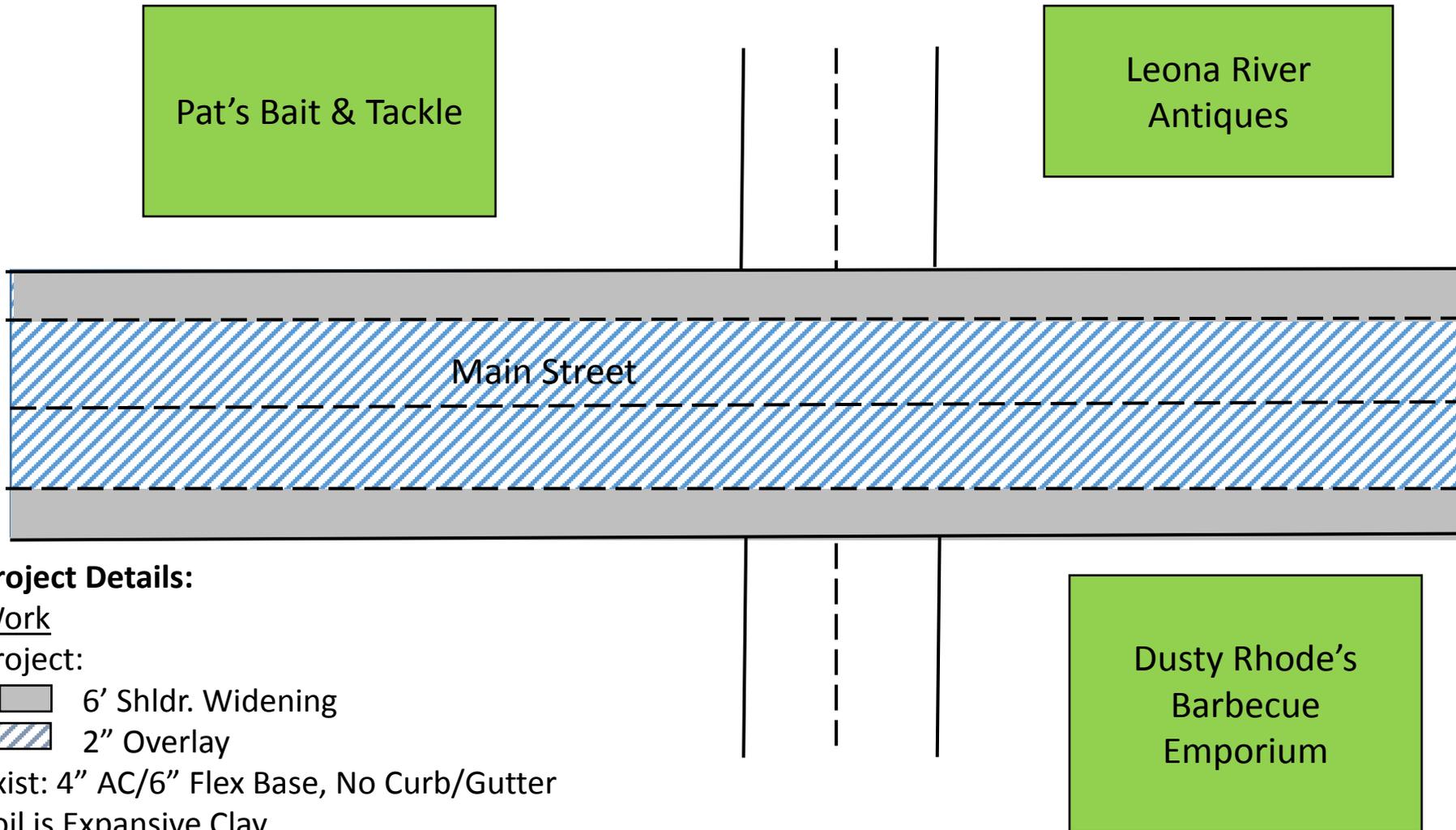
Project Details

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 is M-F, 6:30 - 7:30 am and 6:00 - 7:30 pm.

Discussion will be expanded to discuss alternatives and challenges for full replacement of short- and medium-span bridges.

Exercise E: Small Town Intersection



Project Details:

Work

Project:

 6' Shldr. Widening

 2" Overlay

Exist: 4" AC/6" Flex Base, No Curb/Gutter

Soil is Expansive Clay

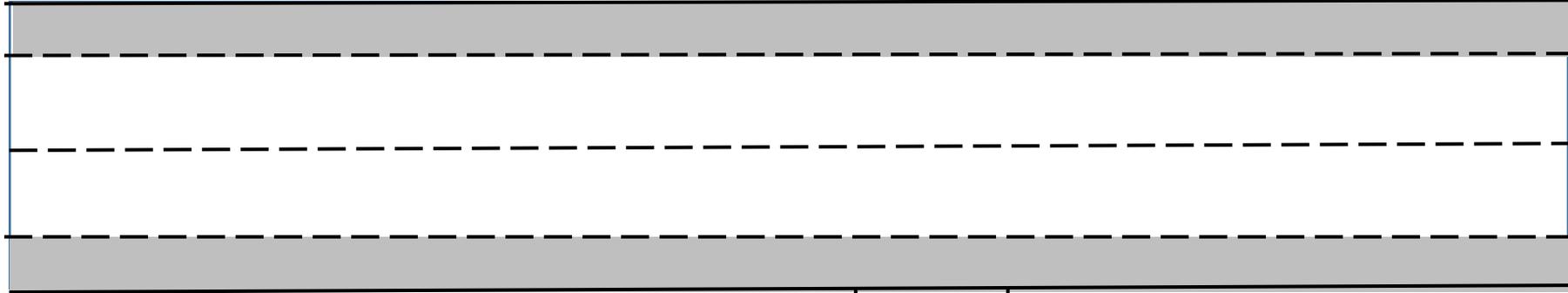
Traffic

AADT = 5,000 for main road, 1,000 for crossroad

Peak: M-F 6:30 am to 7:30 am and 6:00 pm to 7:30 pm, wkend heavy traffic to recreational area

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

Exercise F: Rural Road Widening



Project Details:

Work

Project:

FDR entire existing 24' width

Add 6' Shldr. Widening 

Place 4" HMA surface

Length: 3 miles

Exist: 2" AC/8" Flex Base, No Curb/Gutter

Soil is Expansive Clay

Traffic

AADT = 5,000 for main road with 20 driveways

Peak: M-F 6:30 am to 7:30 am and 6:00 pm to 7:30 pm

Possible Detours: Result in additional 5 miles.

Traffic

AADT = 5,000 for main road with 20 driveways

Peak: M-F 6:30 am to 7:30 am and 6:00 pm to 7:30 pm

Possible Detours: Result in additional 5 miles.

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



List Top 5 Challenges



1. _____

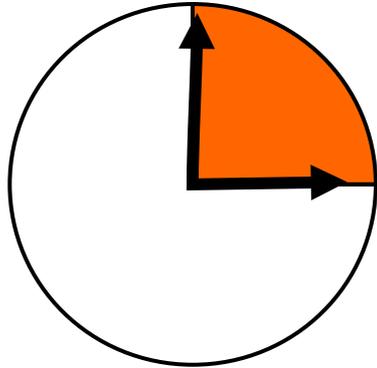
2. _____

3. _____

4. _____

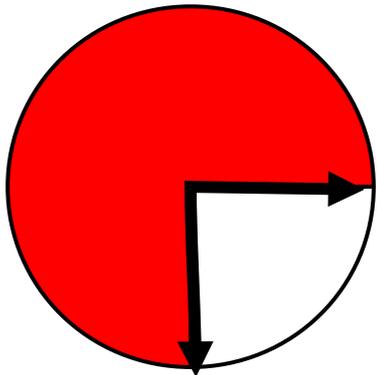
5. _____

Suggested Time Utilization



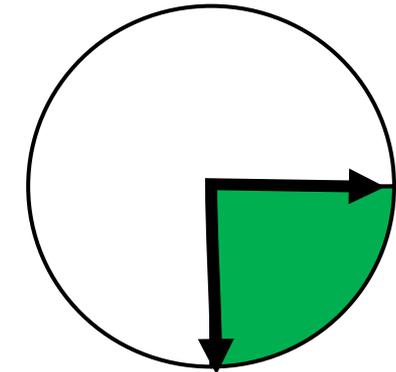
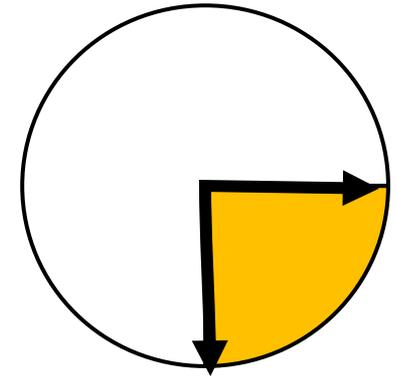
- General project discussion – 15 min

- Items to consider – 15 min



- Top five challenges – 45 min

- Information needs – 15 min



Facilitator Report



- Briefly describe project
- Top 5 challenges
- Information needs

Groups



Group	Facilitator	Reporter
A	Chad Dabbs	Brandon Sparkman
B1	Darwin Myers	Christian Mendoza
C	Jason Mashell	Solomon Thomas
D	Charles Smith	Brenan Honey
E	Jason Duncan	Jeff Bush
F	Korey Coburn	Justin Thomey
B2	Etienne Ecthovakang	Tina Massey

Group Meetings



1:00 – 2:30

District Workshops on Accelerated Construction

Dallas/Fort Worth/Waco

Westin DFW

June 13, 2017



District Workshops on Accelerated Construction Workshop Summary

AC-PP-17-14

Jon Epps

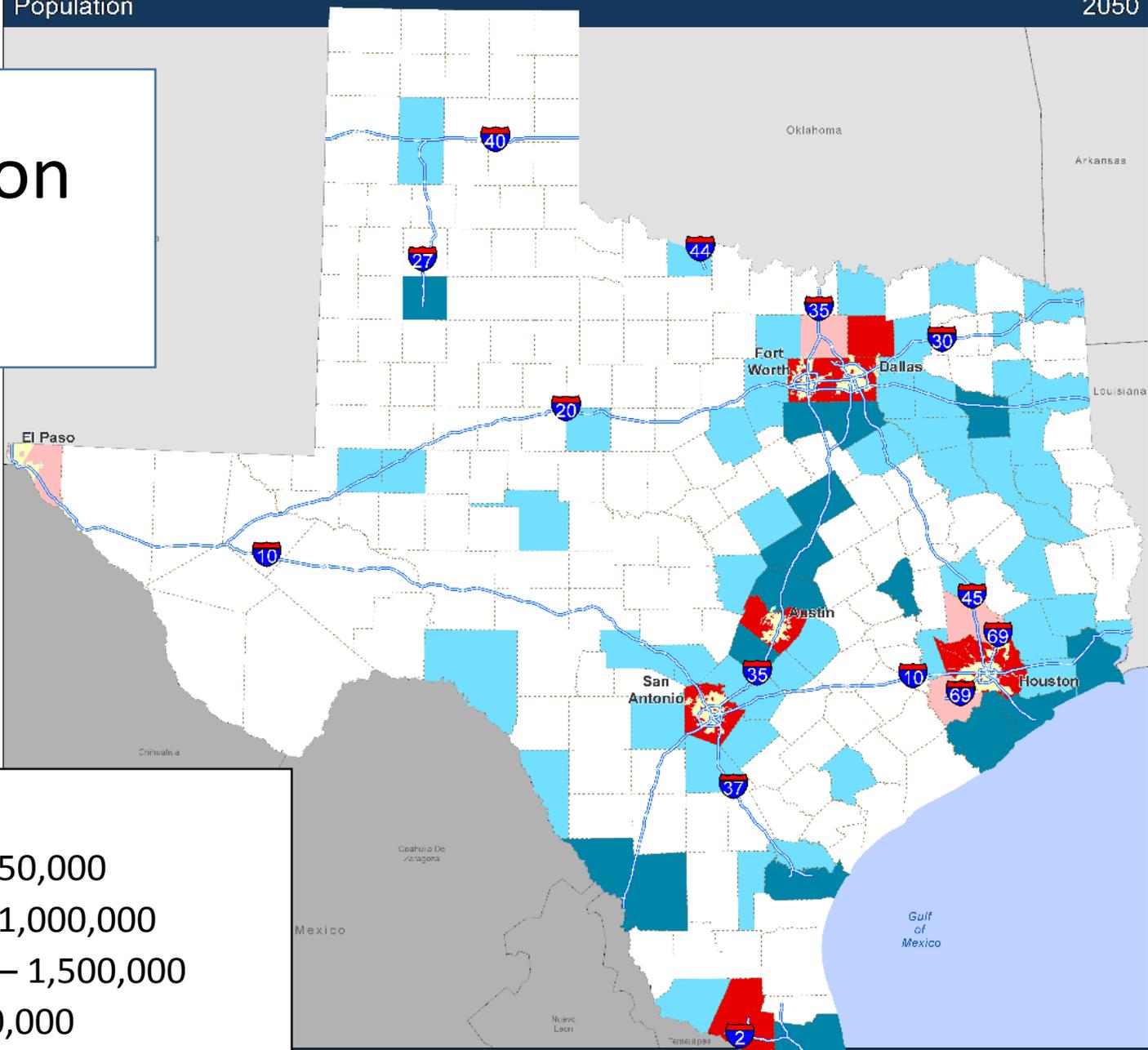
Dallas/Fort Worth/Waco

Westin DFW

June 13, 2017



Population 2050



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

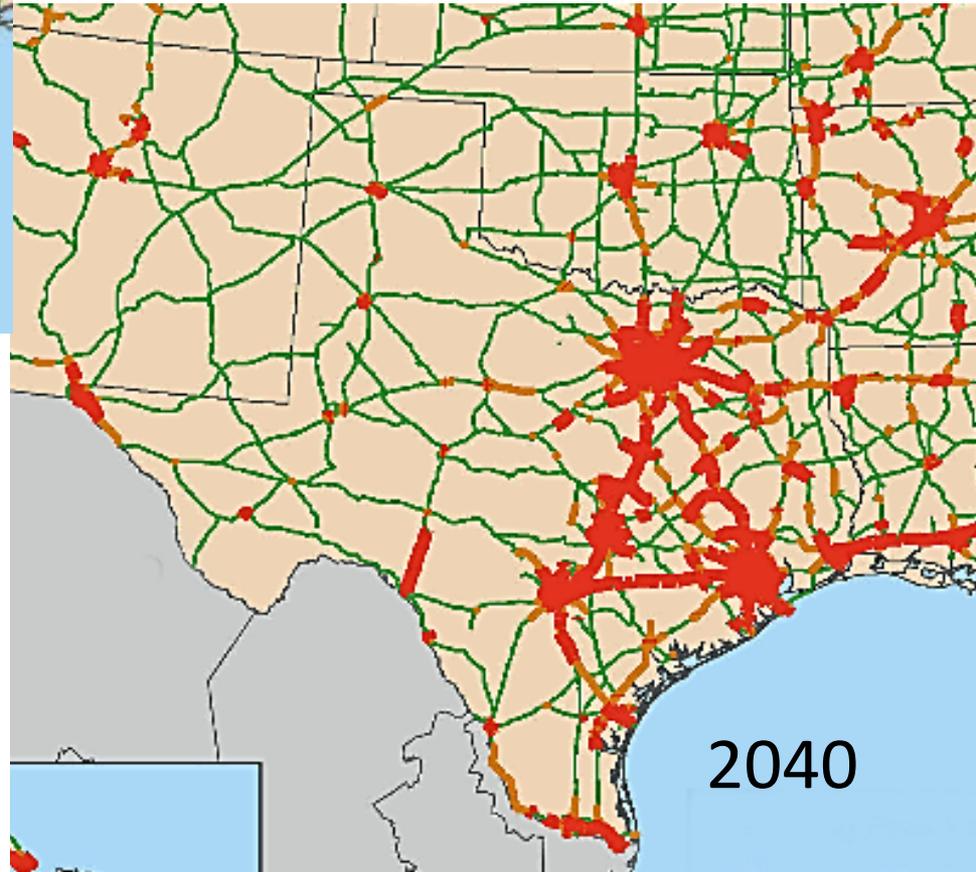
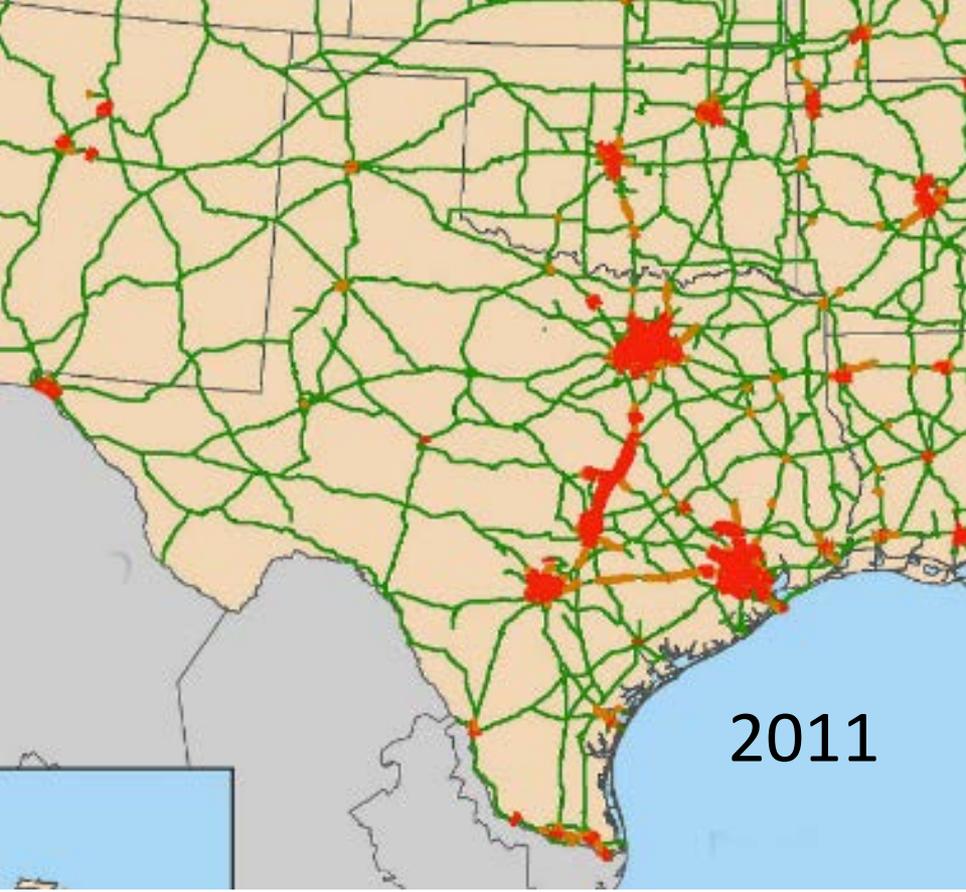
0 100 150 Miles

Texas Department of Transportation
 Transportation Planning and Programming Division
 Data Analysis, Mapping and Reporting Branch
 December 10, 2015

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 Texas Department of Transportation
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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 Construction

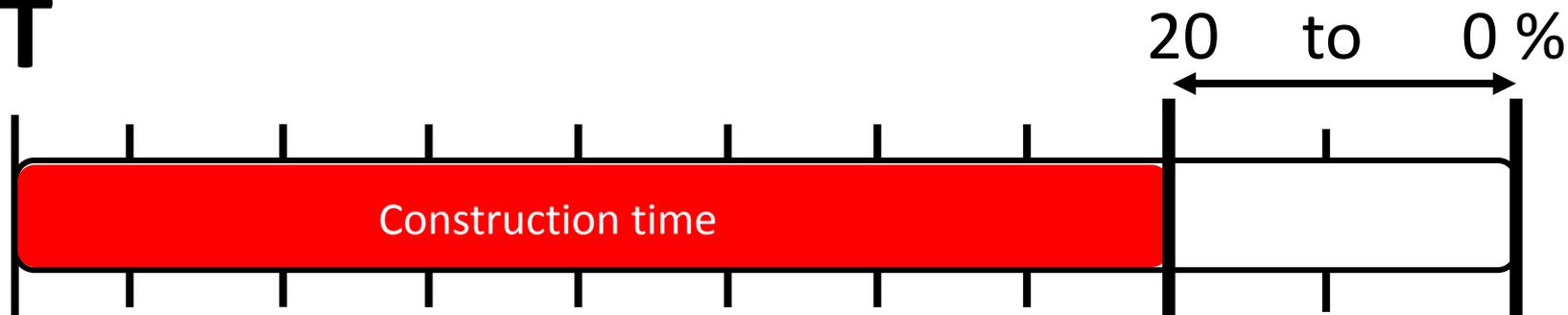
- Visibility to public
- Safety
- Economics



Acceleration Goals

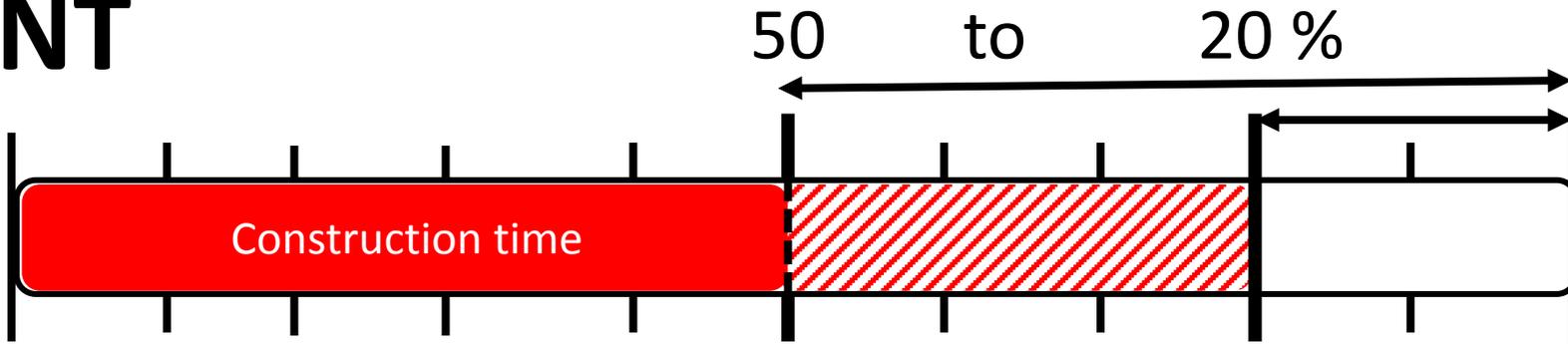


NOT



reduction in time to complete project

WANT



Economic Consideration

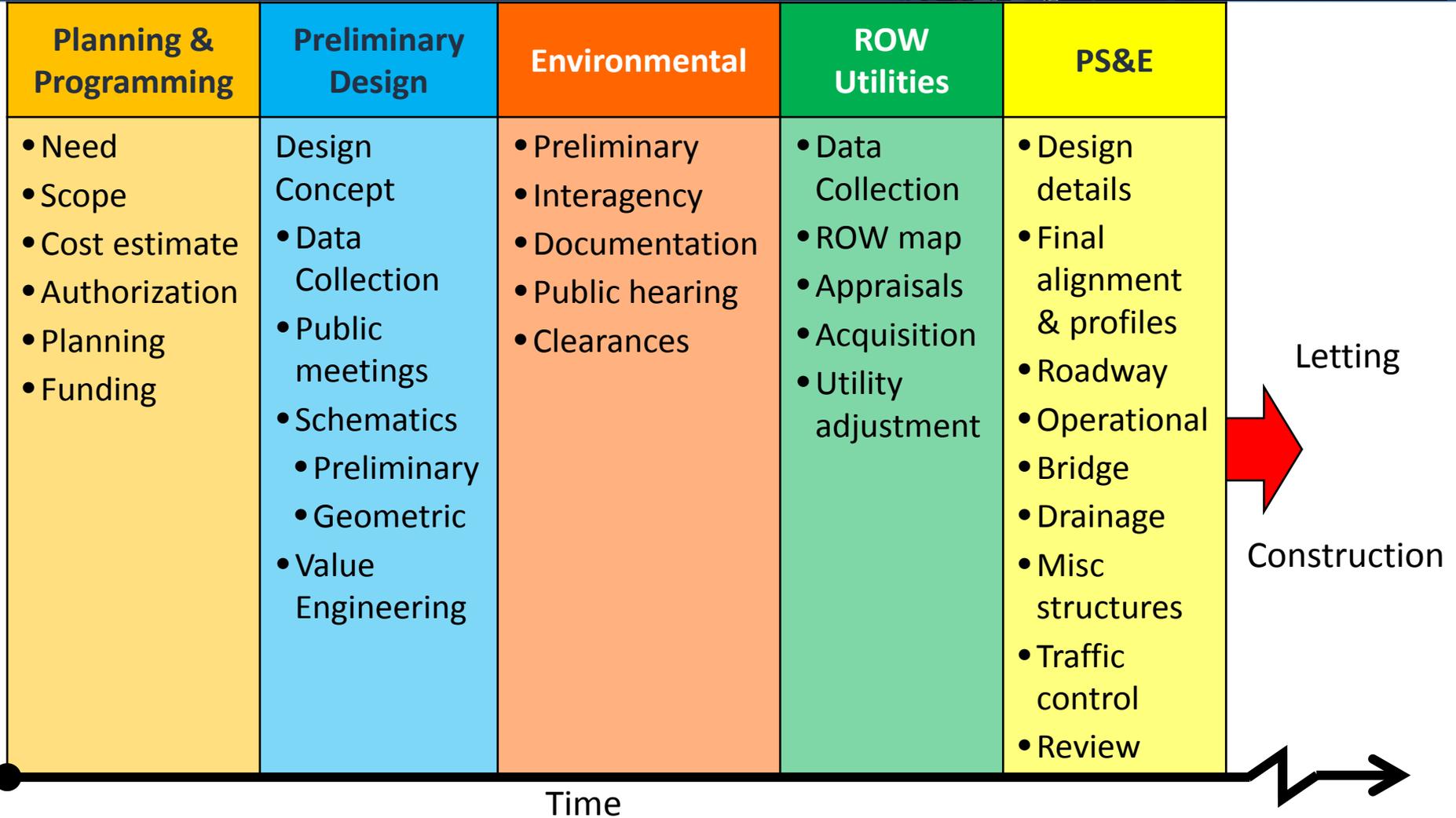


- Direct project costs
 - Agency
 - Some contractor
- Indirect project costs (user/non-user)
 - User fuel/time
 - Roadside businesses
 - Business efficiency (timely delivery)
 - Some Contractor

All costs eventually borne by the public



Project Delivery



Katy Freeway (IH-10)

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



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

Best Practices in Accelerated Construction Techniques

Supported by the
National Cooperative Highway Research Program

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

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



Economic Incentives - Contractor

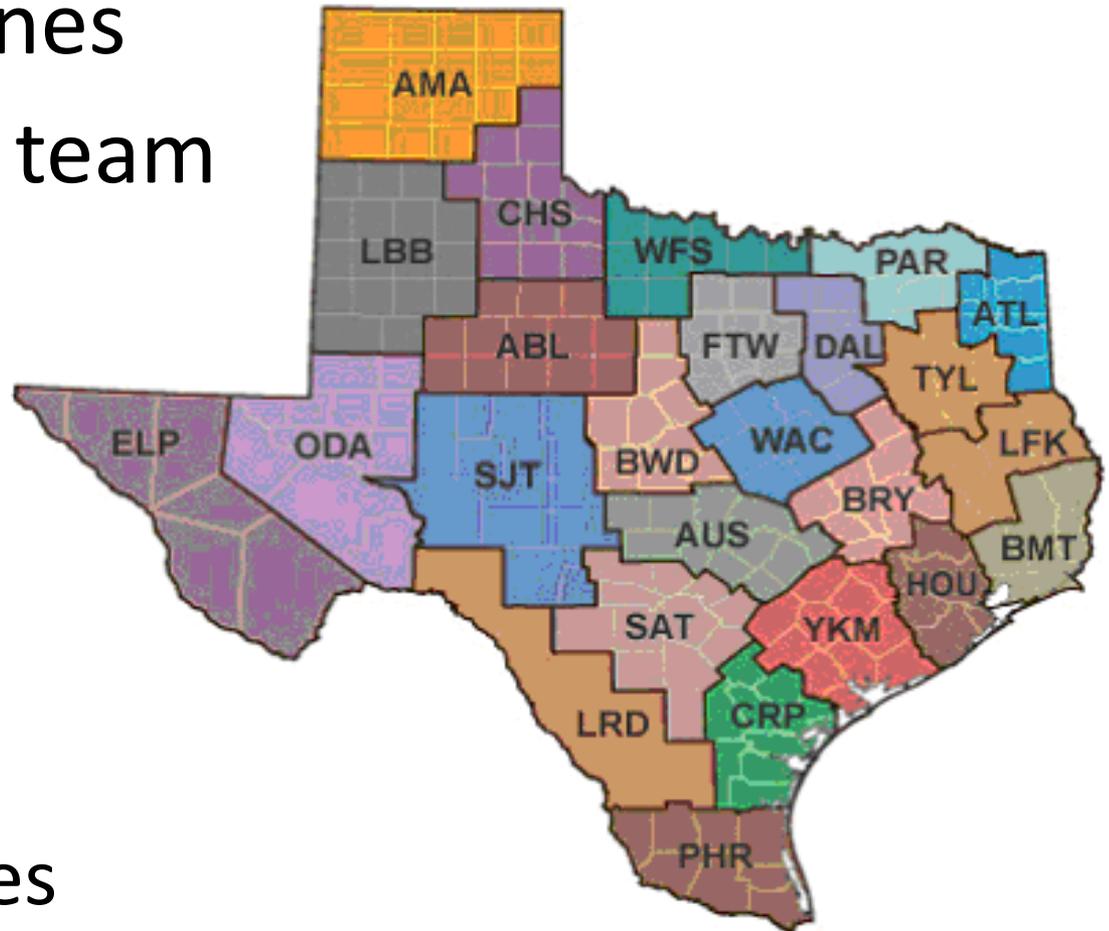
- One job/occasional job
- Return on investment (equipment)
- Bonding capacity
- Backlog of work
- Risk



Policies and Procedures



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



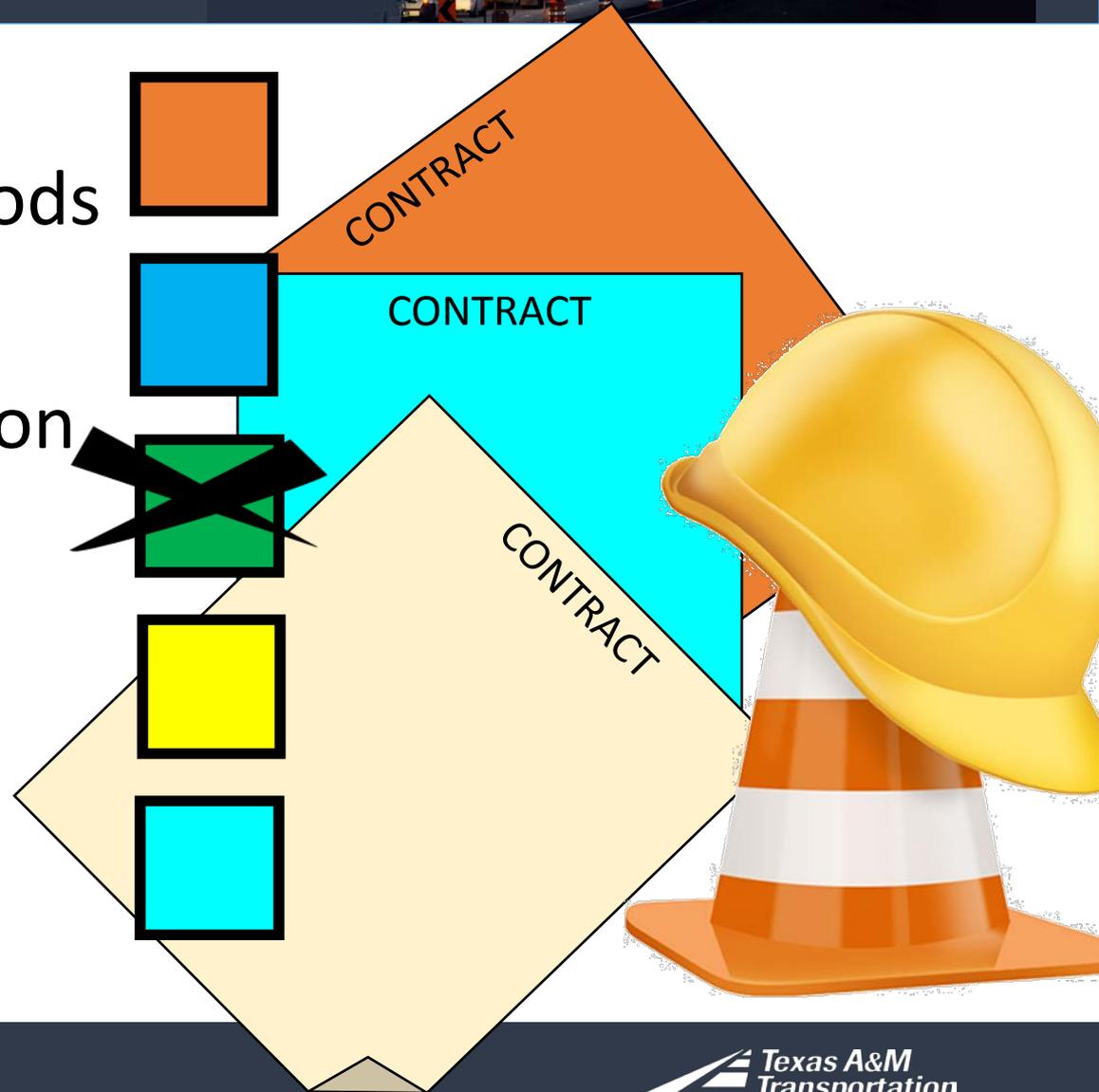
Involvement of Contractor

- Planning and design review
- Partnering
- Communication
- Workforce



Development Needs

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



Development Needs

- Evaluation tools to allow use of existing materials
 - Condition of existing material
 - Recycling
- Traffic modeling
- Economic analysis
- Rapid QC/QA
- Removal & replacement of materials
- Equipment development
- Materials development





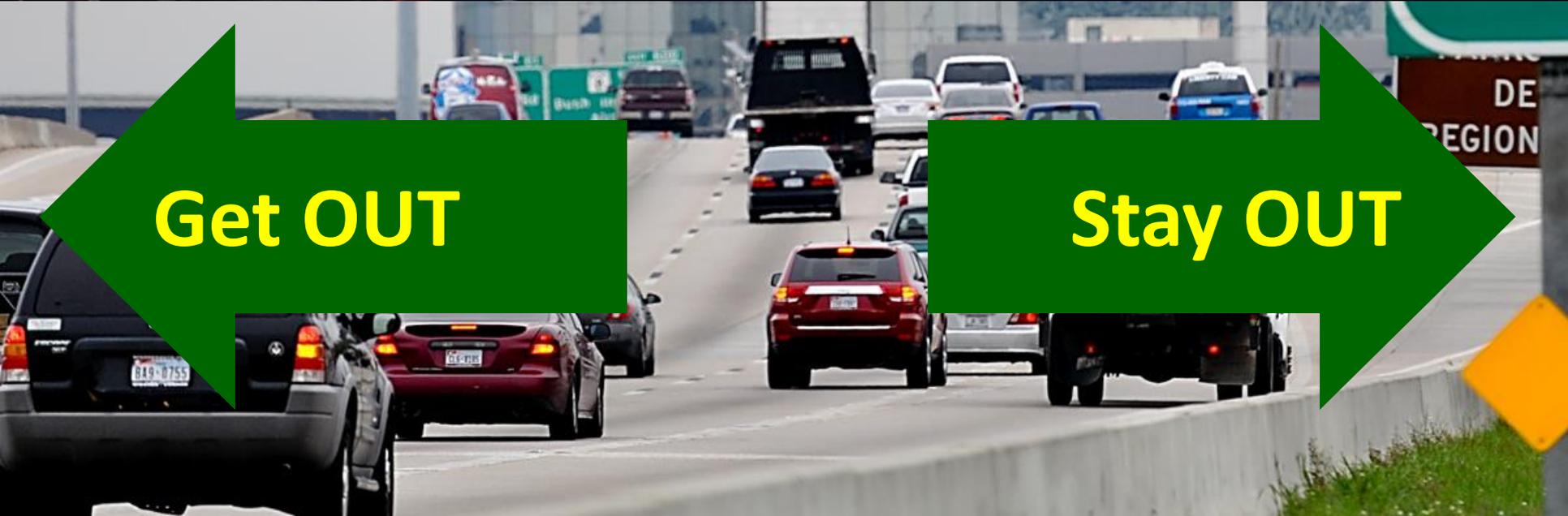
CAUTION

Not All Projects Are
Suitable for
Accelerated Construction



Get IN

Stay IN



Get OUT

Stay OUT



District Workshops on Accelerated Construction

District Workshops on Accelerated Construction

Dallas/Fort Worth/Waco

Westin DFW

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