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Executive Summary

Accelerated Construction Technology Transfer (ACTT) is a strategic process that identifies innovative techniques and technologies to reduce construction time on major highway projects while enhancing safety and improving quality. In September 2003, the Texas Department of Transportation (TxDOT) hosted a two-day workshop that applied ACTT principles and practices to the real-life case of "Project Pegasus," a major reconstruction of downtown Dallas traffic arteries now in the planning phases.

The workshop, which was held September 9-11 in Dallas, Texas, brought together almost 100 attendees from 19 states, including Washington, DC. Its purpose was twofold: to draw on the expertise of participants to help generate specific, practical recommendations for the ongoing development of Dallas's Project Pegasus; and to demonstrate for attendees how the ACTT process works in a real-life scenario so that they could apply ACTT in their own agencies. The key element of the workshop was the brainstorming session, which brought together experts from across the country with their local counterparts to search for methods and measures that would help TxDOT achieve its chief project objectives, namely minimizing construction time and traffic delays.

Project Pegasus consists of total reconstruction of the IH30/IH35E interchange — locally known as the "Mixmaster" — as well as other portions of both highways. The project will involve some 11 miles of roadway and over 99 entrance/exit ramps; moreover, the roads to be rebuilt are crossed by busy freight and commuter rail lines, and wind their way through and near historic buildings, hospitals, public parks, and flood-control levees. Because neither IH30 nor IH35E has been substantially improved since their original construction in the early 1960s, the redesign of the corridors will necessarily be dramatic in order to comply with current safety requirements and traffic-management guidelines. Another challenge presented by the project is handling the hundreds of thousands of vehicles that travel through the Mixmaster interchange each day. These are precisely the issues that ACTT was developed to confront, making Project Pegasus a natural choice as the topic for a national ACTT workshop.

Opening the workshop on September 9 were three officials representing TxDOT: Robert Nichols of the Texas Transportation Commission, Dallas district engineer Bob Brown, and the city's interim director of transportation planning and development Brian Barth. Following their remarks, the Chair of TRB A5T60, Don Lucas, posed the question "Why ACTT? Why Now?" before bringing on several TxDOT representatives to give an overview of Project Pegasus.

Over the course of the following day and a half, participants broke into nine "Skill Set" teams to examine how ACTT methods could be implemented to accelerate various aspects of the project. Once the Skill Set teams had developed lists of ideas, workshop participants began intermingling so that members could consult with experts from other Skill Sets. As the workshop progressed, each team completed report forms summarizing their ideas and recommendations (included as Appendix C), and also narrowed the results of their brainstorming and consultation down to a list of five to seven "priority" recommendations. These lists were then presented by each Skill Set team to the entire conference.

The workshop Skill Sets selected by TxDOT prior to the start of the workshop were: Environment; Geotechnical/Materials/Accelerated Testing; Structures; Right-of-Way/Utilities/Railroad; Innovative Financing and Contracting; Roadway/Geometrics; Traffic Engineering/Safety/ITS/Worker Health; Construction; and

Long-Life Pavements/Maintenance. Each Skill Set team focused on how the ACTT process applied to the specific concerns of their area of expertise while collectively, the teams searched for methods/measures to help TxDOT achieve its goals of maintaining traffic with minimal disruption, accommodating regional/national/international events, providing access to emergency facilities, reducing construction time from 7 to 4 years, and maintaining a safe work zone.

To help TxDOT achieve its project goals, the teams offered the following recommendations, many of which were deemed viable and will be pursued, according to TxDOT Dallas District management:

Environmental

- Consider tree "buffer" to mitigate Section 4(f) impact
- Coordinate timing of Pegasus with that of other Dallas-area roadway projects
- Allow time in project schedule to deal with historic-property issues
- Develop contingency plans for contaminated soil/groundwater
- Noise study still needed

Geotechnical/Materials

- Check for contaminated soil *before* design and construction phases
- Consider future needs, geometry, etc. when looking at retaining-wall options
- Make aesthetic-related decisions early in design phase
- Dallas has problematic soils; address stabilization options early

Structures

- Prepare structure development report
- Call for contractor bids when design plans 30% complete
- Prefab as much as possible
- Consider prefab, temporary, reusable bridges during construction

Right-Of-Way/Utility/Railroad

- Initial cost estimates in this category were probably too low
- Outsource land acquisition
- Hire one utility consultant to coordinate with all utilities
- Determine staging-area needs (e.g., hazmat, pavement recycling) early on
- Use new electro-resistivity technology for SUE investigation

Long Life Pavement Design

- Long-term warranties are needed
- Use CRC with 4"-5" asphalt overlay
- Maximize use of recycled concrete
- On-site concrete and asphalt plants if possible
- Use ITS and timed closures to divert traffic

Innovative Contracting/Financing

- Consider joint use agreements with city
- Establish tolls and managed lanes
- In procurement, look at parameters beyond lowest-bid
- Single contract is the best solution
- Delegate authority to single TxDOT project management team

Roadway/Geometrics

- Build or improve frontage roads early
- Route all utilities through a single conduit
- Use recycled pavement material
- Implement HOV restrictions and truck diversions during construction

Traffic/ITS/Safety

- Make worker safety and public safety a priority during planning
- Maintain ITS during construction
- Use local media and Web to provide traveler information
- Coordinate incident management strategies with local EMS, fire, police
- Find alternate routes to allow total closure of IH30
- Expand bus service and promote carpooling during project

Construction

- Use Design-Build with one large contract
- Involve construction industry early to minimize redesign
- 10-day turnaround on review/approval process
- Identify pavement-life goals; let designer and contractor find best solution
- Factor in time and expense of preparatory projects such as utility relocation

With the workshop now completed, it now remains for TxDOT to sift through the various workshop ideas/recommendations and decide which ideas should be implemented in future planning, design, and construction phases of Project Pegasus. Six-month and one-year meetings will be coordinated with TxDOT to evaluate the long-term benefits of the workshop and the extent of the implementation of its recommendations.

CHAPTER 1

ACTT Background & Purpose

In recent years, communities have witnessed a tremendous increase in highway construction activity, addressing the need to preserve or rebuild our highway infrastructure. Although highway construction is unavoidable, unnecessarily long construction time should be avoided because the process is costly, exposes construction workers to traffic, and subjects motorists to substandard conditions. Accelerated Construction Technology Transfer (ACTT) can help to minimize traffic delays and community disruptions by reducing cost and construction time, while improving construction quality and workzone safety.

1.1 BACKGROUND

ACTT is a strategic process that uses innovative technologies and techniques to reduce construction time on major highway projects while improving construction quality and workzone safety. A complete Accelerated Construction approach involves the evaluation of all aspects of highway projects from planning and development to design and construction within a highway corridor. Successfully deploying ACTT for the benefit of the traveling public requires a thorough examination of all facets of highway corridors, with the objective of improving safety, optimizing cost effectiveness, and minimizing adverse impacts.

Recommendations outlined in Special Report 249 from the Transportation Research Board (TRB) called for the creation of a forum to promote accelerated construction in the highway infrastructure. Based on this recommendation, TRB Task Force A5T60 was formed in 1999 with the following objectives:

- Remove barriers to innovation;
- Advocate continuous quality improvement and positive change;
- Enhance safety and mobility;
- Encourage the development of beneficial strategies; and
- Create a framework for evaluating proposed innovations.

Fully supporting the task force's mission and objectives, the Federal Highway Administration (FHWA) and the Technology Implementation Group (TIG) of the American Associations of State Transportation Officials (AASHTO) joined the task force's outreach effort. This resulted in the formation of a national resource pool known as the "National Skill Sets Council" and completion of two ACTT pilot workshops. With successful completion of two ACTT pilot workshops (one in Indiana and the other in Pennsylvania), A5T60 passed the concept off to TIG and the FHWA to continue the effort by conducting all future workshops.

In 2003, the ACTT Management Team, consisting of TIG and FHWA representatives, started implementing the ACTT program by sharing its workplan with State DOTs and soliciting their consideration of the concept on major highway projects by hosting an ACTT workshop. The Texas Department of Transportation (TxDOT) selected "Project Pegasus" as the focus of the workshop. The rationales for choosing this particular project, which involves the reconstruction of IH 30 and IH 35E near downtown Dallas, include:

- The corridor was already due for major reconstruction and rehabilitation;
- Proximity to the major employment centers and high traffic volumes of downtown Dallas meant there was a need to accelerate construction;
- The project is still in the planning process and has not received environmental clearances; and
- TxDOT is open to innovation and willing to consider and apply new concepts.

1.2 PURPOSE OF ACTT

The purpose of an ACTT Workshop is to explore innovative ways that highway corridors could be brought to full service more quickly and safely, and with fewer adverse impacts on the traveling public. The Project Pegasus workshop brought a multidisciplinary national team of transportation professionals together with their local counterparts. Over the course of two days, the workshop participants explored innovative ways to accelerate the construction of Project Pegasus. The workshop included plenary sessions, breakout sessions, skill set interaction, closing remarks, and a follow-up action plan.

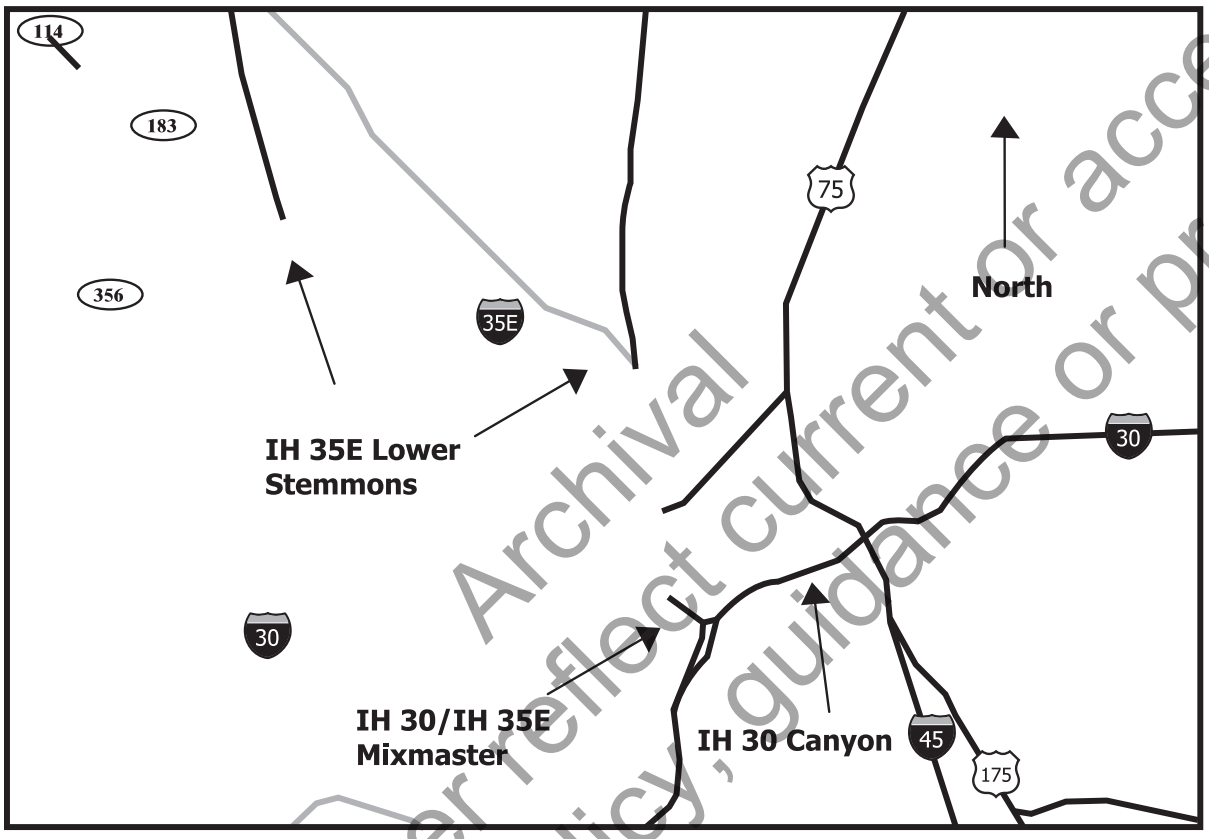
CHAPTER 2

Project Details

2.1 CORRIDOR DESCRIPTION

Project Pegasus is intended to totally re-design and restore mobility to the two major Interstate Highways directly serving downtown Dallas. The study area, shown in Figure 1, covers IH 30 from Sylvan to IH 45 and IH 35E from Eighth Street to Empire Central (north of SH 183). The interchange of IH 30 and IH 35E is locally known as the "Mixmaster" and the depressed portion of IH 30 south of downtown is known as the "Canyon." The section of IH 35E from the Mixmaster to SH 183 is referred to as "Lower Stemmons."

Figure 1. Project Location



The total project, scheduled for completion over 36 months, involves approximately 11 miles of roadway and over 99 existing entrance/exit ramps. Future freeway volumes range from 200,000 to 320,000 vehicles per day. The design widens both IH 30 and IH 35E and the interchange, and includes reversible HOV/Managed lanes. Among the challenges facing the project are: high traffic volumes, NAFTA-related traffic, the problem of balancing transportation needs with local access, extremely constrained right-of-way, parklands, historic buildings, meeting current design standards, potential construction impacts, affordability, and integrating urban design. The project team is currently at work on the schematics and environmental assessment, with an eye on development alternatives, traffic considerations, and extensive public and agency input.

2.2 ACTT GOALS

It was TxDOT's hope that the ACTT approach could help reduce construction time while giving Dallas motorists a high-quality product. TxDOT established seven goals for ACTT Workshop participants:

- Maintain traffic with minimal disruption
- Accommodate regional/national/international events
- Provide access to emergency facilities and businesses
- Reduce construction time to 4 years
- Maintain a safe work zone
- Minimize the delays introduced by right-of-way, utilities, and railroad
- Incorporate context sensitive design

2.3 PROJECT PEGASUS OBJECTIVE AND GOALS

The primary objective of Project Pegasus is to relieve traffic congestion along IH 30, IH 35E, and throughout the Mixmaster interchange. The goals for the project include:

- Maximizing the vehicular capacity of the freeway system by integrating High Occupancy Vehicle (HOV) lanes, Intelligent Transportation Systems (ITS), Transportation Systems Management (TSM), and Travel Demand Management (TDM) elements into the design
- Minimizing the need for additional right-of-way
- Providing more reliable transportation facilities by decreasing congestion and travel times
- Improving interregional connections to existing and proposed roadways and transit facilities
- Enhancing travel and accessibility to downtown Dallas, major employment areas and activity centers within the corridor
- Maintaining bicycle and pedestrian access across the facilities
- Integrating urban design elements that reflect the character and location of the surrounding communities and
- Finding a solution that is both technically and financially feasible

2.4 PROPOSED IMPROVEMENTS

The general concept is for five to six lanes in each direction with one- or two-lane reversible HOV/Managed lanes in the median. A continuous frontage road system is also proposed along portions of the route to maintain access to adjacent properties. Estimated construction and right-of-way costs are approximately $750 million, as of May 2003. The following highlights the elements of the preferred design:

- Includes a continuous and reversible HOV/M lane system
- Adds one general-purpose travel lane in each direction in some areas
- Meets current design standards for freeway lanes and shoulder widths
- Eliminates left-hand merges and diverges
- Provides "lane continuity," so that drivers need not change lanes to stay on same freeway
- Eliminates inside merges on main lanes
- Includes direct connections in all directions in the IH 30/IH 35E interchange
- Eliminates the severe freeway weaving area between Spur 366 and DNT
- Provides continuous surface frontage roads along IH 30 and IH 35E
- Eliminates the current Collector-Distributor (C-D) roads adjacent to the Canyon main lanes
- Simplifies South Central Expressway interchange with IH 30
- Provides HOV/M lane access at Commerce Street and Medical Market Center

- Allows adequate horizontal and vertical clearance for bicycle and pedestrian crossings
- Incorporates aesthetic elements, landscaping and urban design treatments
- Provides 10-foot sidewalks on freeway cross-streets
- Accommodates bicycles in a shared lane by allowing 14-foot outside lane widths at cross streets over/under the freeway
- Includes ITS

2.5 PROJECT BACKGROUND

The IH 30 and IH 35E corridors were studied as part of the Major Transportation Investment Study (MTIS) conducted on the Trinity Parkway Corridor between 1996 and 1998. The purpose of the MTIS was to develop a solution to congestion in the IH 30 Canyon and IH 35E/IH 30 interchange near the Dallas Central Business District (CBD) and the Trinity River. The study — which extensively involved the public and public agencies — evaluated numerous travel modes, considered over 40 alternative approaches, and produced preliminary designs, traffic, hydraulic, and environmental analyses.

The final $1 billion recommendation included improvements to the existing interchange and interstates; HOV lanes; a new tollway; an extension to Spur 366; a light rail line; bicycle and pedestrian improvements; ITS; and employer trip reduction programs. Because no single agency would be responsible for designing and building all of the recommended improvements and many of the improvements have independent utility, they are being further developed by the appropriate agencies. Project Pegasus addresses the improvements to the Mixmaster and interstate highways, while incorporating HOV lanes, ITS, and bicycle and pedestrian elements in the corridor.

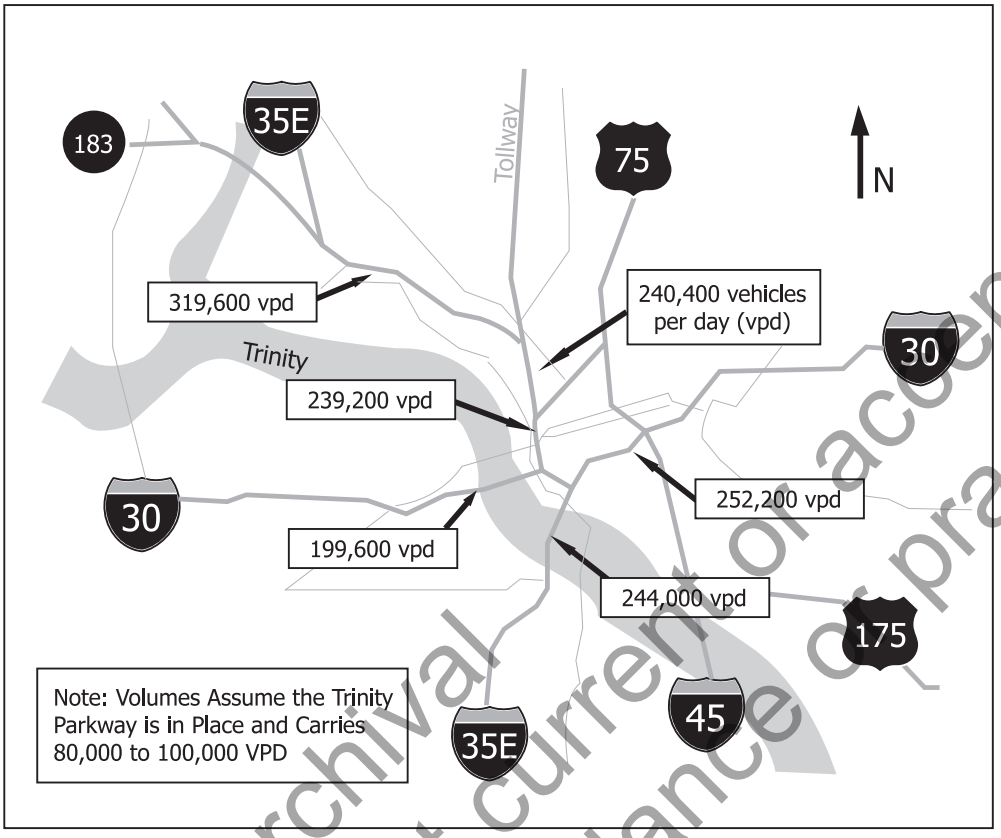
2.5.1 PROJECT CHALLENGES

Designed in the 1950s, IH 30 and IH 35E were built between 1958 and 1962. The current design of the freeway, service roads, ramps, and surface streets in the area contribute to the poor operation of the freeways and do not properly provide for today's major traffic demands. Forced lane changes, abrupt and unexpected merges, short weaves, and left-hand entrance/exits compound the problems. Additionally, the IH 30/IH 35E interchange does not include direct connections from eastbound IH 30 to southbound IH 35E and northbound IH 35E to westbound IH 30.

Additionally, the design standards for freeway and interstates have changed since the roadways were built. The roadways do not meet current design standards with regard to ramp acceleration and deceleration lengths, spacing of interchanges and ramps, vertical clearances, horizontal clearances, and sight distances.

Congestion in this area slows travel for many miles along other freeways feeding into downtown, such as IH 35E, IH 45, US 75, and IH 30. No significant improvements to roadway capacity have been implemented since these freeways were originally constructed. Several bottleneck removal projects have been implemented, which have provided only minor relief in traffic. The travel demand along the IH 30/IH 35E corridors is beyond the current capacity of the freeways. This is most evident in the morning and evening rush hours on weekdays, with heaviest traffic flows northbound and westbound in the morning hours, and southbound and eastbound in the evening hours. On average days, traffic on the freeways is congested for more than six hours daily, with average speeds of approximately 20 mph.

Figure 2. 2026 Daily Traffic Volumes



The redesign of IH 30 and IH 35E have provided numerous challenges to the design team, including:

- NAFTA Corridor & Truck Traffic – Heavy truck traffic on IH 35E is estimated to be over 10 percent of daily traffic volumes. Given daily volumes of 320,000 in some areas, this equates to over 32,000 trucks a day.
- Multiple Major Traffic Movements – There are five major interchanges within a very short distance – IH 30/IH 45, IH 30, IH 35E, IH 35E/Spur 366, and IH 35E/Dallas North Tollway (DNT). The weaving areas between the major movements conflict and influence traffic operations significantly.
- Balancing Transportation Needs with Local Access – There are 99 existing entrance and exit ramps within this 11-mile long project area. The primary purpose of the interstate system is national defense, not local access. Current interstate design standards for ramp spacing and weaving distances will not permit all of the existing entrance and exit ramps to remain in the new design.
- Constrained Right-of-Way – These corridors are highly developed and right-of-way is limited by development, railroads, and the Trinity River Levee system.
    - *Development* - The property adjacent to the freeway is home to numerous large buildings and activity centers, including the Dallas Convention Center, Reunion Arena, American Airlines Center, Dallas Market Hall, InfoMart, World Trade Center, and seven hospitals.
    - *Railroads* - Four active railroads cross IH 30 and IH 35E. The Union Pacific Transcontinental rail line crosses both IH 30 and IH 35E with 40 trains a day. The DART Light Rail crosses IH 30 and carries both the Blue and Red Line with 365 trains per weekday. The Trinity Railway Express Commuter Rail line crosses IH 35E near SH 183 and

carries over 50 passenger trains per weekday and is an active freight line. Three of these bridges will require full reconstruction while maintaining rail operations.

- *Trinity River Levee System* - The levees are approximately 35 feet tall and provide flood protection to the City of Dallas. Both IH 30 and IH 35E cross over the top of the levees and then must drop to ground level to pass under the Houston Street Viaduct.

- Environmental Issues – There are four publicly owned city parks immediately adjacent to the interstates. In addition, several historic properties are adjacent to the freeways, including Farmers Market, Dealey Plaza Historic District, West End Historic District, and several other buildings eligible for listing on the National Register of Historic Places. The Houston Street Viaduct, which crosses over the Mixmaster area, was built in 1911 and is listed on the National Register of Historic Places. The openings of the bridge are 65 foot wide and constrain the width of the freeways as well as both the horizontal and vertical alignments (see Figure 3).

Figure 3. Houston Street Viaduct

- High Traffic Volumes – Current traffic volumes within the study area range from 127,000 to 286,000. Future traffic volumes on the freeway in 2026 are projected to be between 200,000 to 320,000 vehicles per day. These volumes assume the Trinity Parkway will be in place and carry 80,000 to 100,000 vehicles per day.
- Design Standards have Changed Since Roadways were Originally Built – The existing roadway does not meet current interstate design standards for such parameters as horizontal and vertical clearances, lane and shoulder widths, acceleration/deceleration lanes on ramps, ramp spacing, sight distances, inclusion of left-hand exits and entrances, lane continuity, signage, and the ability to provide for incident management.
- Access & Traffic Handling during Construction – With so many activity centers including downtown, major employers, and hospitals within the corridors, constructability and access have been an underlying concern.
- Affordability – TxDOT and this region are faced with a funding shortfall, and no funding source has been determined for the project. Having an economic and efficient design that has the support of the community will be vital to moving towards funding and construction.
- Urban Design – Project Pegasus is one of the first Dallas-area projects in which the TxDOT, from the very early stages of planning, has actively considered urban design and landscape treatments to complement and enhance the aesthetic quality of the freeway corridors.

2.5.2 PUBLIC AND AGENCY INVOLVEMENT

A large component of the project is public and agency involvement. In addition to a project newsletter, a website has been developed – (www.projectpegasus.org). This site has more much information than can be contained in a single newsletter, such as the project history, maps, and summaries of meetings. It also allows the design alternatives to be posted in .pdf format, thereby facilitating public review. There are also fill-in forms on the website allowing visitors to e-mail comments, be added to the mailing list, or request a presentation.

Other public/agency involvement efforts include the establishment of a Project Coordination Work Group and a Community Work Group, which both meet on a regular basis. To inform businesses and property owners, information packets have been hand-delivered to business and property owners along the corridor. A portable project kiosk has also been used at public locations within the project study area to inform the public about the project's existence, purpose, need, and progress.

2.5.3 DESIGN DEVELOPMENT

The development of alternatives has occurred in three phases.

- In Phase 1 (November 2001 to May 2002), the study team developed conceptual alternatives. The alternatives were based on identified deficiencies and travel patterns in the study area, previous planning efforts, and public and agency input. Previous planning efforts include the Trinity Parkway Corridor MTIS recommendations for IH 30 and IH 35E.
- In Phase 2 (June 2002 to January 2003), having selected the most promising alternatives from Phase 1, the study team continued to develop these proposals to a higher level of detail — incorporating, as appropriate, comments and concerns from the public and study work groups.
- During Schematic Development (February 2003 to July 2003), the study team worked on refining the locally recommended design from Phase 2. This phase included the preparation of a detailed design schematic, design exception report, interstate access justification report, signing schematic, and environmental assessment.

The schematic design effort includes a detailed traffic analysis, signing schematic, Design Exception Report, Interstate Access Justification Report, and draft HOV/M operations plan.

2.5.4 VALUE ENGINEERING

Prior to beginning the schematic design, a week-long Value Engineering workshop was held to review the project design. Value Engineering is a program to improve project quality, reduce project costs, foster innovation, eliminate unnecessary and costly design elements, and ensure efficient investments. Held in March 2003, the workshop was attended by representatives from TxDOT, FHWA, City of Dallas, Dallas County, North Texas Tollway Authority, North Central Texas Council of Governments, and Texas Transportation Institute. Sixteen geometric and 10 structural issues were analyzed. The overall design and traffic operation would be improved by the recommendations and could mean potential cost savings of 6.5 percent.

2.5.5 ENVIRONMENTAL DOCUMENTATION

Based on the schematic design, an Environmental Assessment and Section 4(f) Statement are being prepared to document social, economic, and environmental effects. Because the project corridor is heavily developed, little impact to the natural environment is anticipated. Major social, economic and environmental issues include land use, access, park land, and historic properties. Awareness of these issues has helped the study team avoid and minimize impacts in most areas. In areas of impact, mitigation will be proposed.

2.5.6. URBAN DESIGN

The urban design component has also been initiated to enhance the transportation corridor environment from the perspectives of both motorists and the adjacent property owners. The Urban Design process involves ultimate "what if" items to be considered for future cost-shared community upgrade projects, such as signage, illumination, public art, landscaping, specialty pavement, community gateways, design of bridge structures, bridge column supports, and so forth.

In the IH 30 Canyon area, where the freeway is depressed, the concept of "lids" over the freeway to create deck parks has also been suggested. This element could be built later, after reconstruction of the freeway, but this option requires that the retaining walls be designed to support a future deck. The City of Dallas is evaluating costs and funding opportunities to finance the decks. The implementation of urban design elements will require cost sharing between the City of Dallas and TxDOT.

2.6 PROJECT STATUS

- The schematic was sent to TxDOT Design Division on July 9, 2003; it has subsequently been forwarded to FHWA for concurrent review.
- The design exception report, interstate access justification report, and signing schematic were sent to TxDOT Design Division on August 20, 2003.
- The draft EA and Section 4(f) Statement are approximately 85 percent complete.

CHAPTER 3

TxDOT Workshop Meeting Details

TxDOT hosted an ACTT Workshop for Project Pegasus on September 9-11, 2003, in Dallas, Texas. Almost 100 people attended from 19 states, including the District of Columbia. Appendix A includes a list of the attendees.

In a pre-workshop meeting with the ACTT Management Team, TxDOT selected the following skill set areas for the Project Pegasus ACTT Workshop:

- Environment
- Geotechnical/Materials/Accelerated Testing
- Structures
- Right-of-Way/Utilities/Railroad Coordination
- Innovative Financing
- Innovative Contracting
- Roadway/Geometric Design
- Traffic Engineering/Safety/ITS
- Construction
- Long Life Pavements/Maintenance

The Innovating Contracting and Innovative Finance sets were combined. A description of each of these skill sets is included in Appendix B.

3.1 OPENING SESSION

The workshop began with opening remarks from three TxDOT officials:

- Commissioner Robert Nichols, Texas Transportation Commission
- Bob Brown, Interim Dallas District Engineer
- Brian Barth, Interim Dallas Director of Transportation Planning and Development

Following these speakers to the podium was Don Lucas of the Heritage Group and Chair of TRB A5T60, who addressed the question: "Why ACTT? Why Now?" After Don's presentation, all workshop participants had an opportunity to introduce themselves. Attendees were next given a brief overview of Project Pegasus by Tim Nesbitt, TxDOT, Project Manager; Sandy Wesch-Schulze, Carter & Burgess, Consultant Team Project Manager, and Richard Mason, TxDOT Deputy Project Manager.

Stu Anderson, Texas A&M University, served as the workshop moderator. He reviewed the agenda and work outline for the next two days. Upon conclusion of the formal Opening Session, the forum broke for a bus tour of the project.

3.2 WORKSHOP PROCESS AND RECOMMENDATIONS

In the next day-and-a-half, the Skill Set groups met to discuss various aspects of the project and methods for accelerating project implementation. After allowing time for each Skill Set group to discuss issues and begin forming ideas, participants intermingled to further discuss and consult with other groups on strategies and concepts.

Each group completed reporting forms, which are included in this report as Appendix C. Each Skill Set group was also asked to rank five to seven ideas in order of top priority, and to make a presentation to the whole conference. The following are the top recommendations relating to each Skill Set.

3.2.1 ENVIRONMENTAL

The Environmental Skill Set group discussed the environmental constraints, opportunities, and pending issues for the project.

Constraints

- There will be a Section 4(f) impact at Stemmons Park. The design needs to include avoidance and/or minimization as well as mitigation. Mitigation could include replanting Live Oak trees or purchasing additional land just south of the park and donating the land to the city.
- The timing of several projects (Project Pegasus, Trinity Parkway and others such as the Southern Gateway) need to be closely coordinated. Could the tolls on the Trinity Parkway be reduced while IH 30 and IH 35E are under construction? The Trinity Parkway has a proposed opening date of March 2012, which could affect the start date on Pegasus. The Southern Gateway has a start date on 2015.
- There are numerous historic properties. Coordination time must be built into the project schedule. A new bridge over the Houston Street Viaduct cannot be constructed because of historical requirements.
- A hazardous materials report has been prepared. Mitigation and contingency plans for contaminated soils and groundwater are yet to be developed. New technologies for quantifying subsurface contamination in place must be investigated.

Opportunities

- Context-sensitive design needs to be linked to design, right-of-way, construction, and financing
- It might be possible to open up Old Mill Creek. This needs to be discussed with the City of Dallas. This could provide an opportunity for water quality and stream restorations. The option of opening up Old Mill Creek should be explored only if there is a need to mitigate for water resources due to adverse impacts from the proposed project.
- IH 30 Canyon decks could be used as staging area for construction

Other Pending Issues

- Socio-economic impacts are semi-resolved. There appear to be no environmental justice issues.
- Noise study is needed to determine impacts and need for mitigation
- Multiple nationwide permits may be needed. It remains to be determined whether pre-construction notification will be required.

3.2.2 GEOTECHNICAL/MATERIALS

This Skill Set group made recommendations in four areas to accelerate construction while maintaining or improving the project.

Testing

- Conduct soil testing prior to environmental clearance. Look for contaminated soil and try to find out before design but definitely before construction.
- Obtain geotechnical information and borings early to help to make design decisions
- Design-build will make the information above even more critical (reduced risk = reduced price)

Design

- During the selection of retaining wall types, consider the phasing of work, future needs, existing ground geometry, subsurface conditions, and impacts of wall treatments on design and construction
- Make decisions on aesthetics early in design and coordination details
- Coordinate with geotechnical team early and often

Soils

- Dallas has problematic soils for pavement sub grades, including expansive clays and high sulfate content soils
- Conduct a detailed geotechnical investigation including sulfate soil determination
- Try to stabilize soils in place
- Stabilization of thick sub-grade layers could be done using deep soil mixing techniques and massive soil stabilization
- Sulfate soil stabilization could be done by engineering solution with existing stabilization agents (lime and cement) or the use of new stabilizing agents

Other

- Save time and stay out
- Look at utilities early
- Consider 24/7 construction
- Train ahead of time to increase efficiency, use techniques and methods on other projects first

3.2.3 STRUCTURES

The top five recommendations from the Structures Skill Set were: prepare a structure development report; call for bids on contract at 30 percent complete; use prefabricated construction; select construction techniques that minimize traffic impacts; employ temporary bridges.

Structures Development Report

- Group structure types to try to create an "assembly line" system and maximize standardization Types could include overpass, mainline, low, medium, high, and retaining walls
- Use high-performance materials
- Look at corrosion-protection strategy
- Maximize use of standardized and prefabricated structures / elements
- Determine foundation requirements early
- Incorporate preformed lightweight fill

Bid Contract at 30 percent Bridge Plans

- Designer prepares plans to 30% with quantities +/-20 percent; then advertises and selects contractor
- Contractor works with designer and owner to complete plans and construct project
- Implementation with single or multiple contracts to allow flexibility

Construction/Prefabrication

- Prefab as much as possible to minimize traffic disruption during construction
- Pre-cast substructure: abutments, bents, columns. Post-tension elements together for continuity
- Pre-cast superstructure: slab, girders, segmental boxes or prefabricated superstructure units
- Incremental launching (Canyon & TRE line)

- Balanced cantilever will reduce crane usage

Temporary bridges

- Use prefab modular bridges for temporary structures or develop standardized modular bridges
- Bridges can be reusable; multiple-use bridges reduce cost, and cost is amortized over multiple projects. When project is completed, give bridge to county or city for bridge replacement or stockpile for future emergency or security use

3.2.4 RIGHT-OF-WAY/UTILITY/RAILROAD

The Right-of-way/Utility/Railroad Skill Set group believes the right-of-way costs were underestimated. TxDOT should assume $75 million for land, $300 million for utilities, and $15 million for railroad relocation.

It was recommended that TxDOT outsource the land acquisition, relocation assistance and negotiation of access. Also, one utility consultant should be hired to design, inspect, coordinate, communicate and cooperate with all utilities. The actual relocation of utilities should be included as part of the highway construction contract and the railroad force account should be used.

In order to start the right-of-way acquisition process and the relocation of utilities, the Right-of-Way Department needs as much information as soon as possible. This should include the schedule as well as the need and location of proposed staging areas (e.g., hazmat, pavement recycling, construction materials). The State currently owns property at US 75 at Carroll Avenue, which could be used as a staging area. Properties that will be difficult to relocate, such as the liquor stores and SPCA, should be acquired as early as possible. The design consultant needs to coordinate early with TxDOT and the railroads.

Other right-of-way and utility issues that should be considered during design are the inclusion of fire hydrant for CD roads and elevated roadways in case water is needed in emergency situations; control of access; 96" sewer line down median of IH 35E (north section); and utilities affected by railroad relocation. The skill set also suggested using a new technology for SUE investigation that relies on electro-resistivity to show hazmat plumes, conduits, and soil strata.

There were also other legal and procedural changes recommended to speed the process; it was recognized that some legislation might be necessary to allow these changes to happen. These recommendations included quick action, the delegation of more authority to Districts, risk management, establishment of criteria to designate when the number of utilities in the corridor had reached the allowable limit, and the consideration of utilities as part of the transportation facility.

3.2.5 LONG LIFE PAVEMENT DESIGN

This Skill Set group looked at five major areas and made several recommendations to accelerate construction while maintaining or improving the design of the pavement.

Warranties

- Long term warranties are needed to assure performance
- Design-build is ideal for this type of guarantee
- Should be performance based
- Include incentives in long-term warranties (10 years)

Pavement Type

- Performance includes such variables as smoothness, friction, noise, cracking, rutting, etc., and should be based on TxDOT deterioration curves
- Recommendations for increased strength/durability
- CRC with 4" – 5" asphalt surface
- Concrete temperature and moisture variations reduced by asphalt overlay
- Asphalt temperature is lowered and rutting reduced when placed on top of concrete
- Surface renewal is easier and less intrusive to traffic

Materials Selection

- Make maximum use of recycled concrete as aggregate base or retaining wall backfill
- Assure long term performance by improving general material specifications so that only premium materials are allowed

Construction Staging Areas

- Promote on-site production or locate production close by to speed up construction; consider on-site concrete and asphalt plants
- Reduces haul time
- Reduced traffic congestion due to construction vehicle ingress/egress

Traffic Control

- Consider total closure
- Utilize ITS to divert traffic
- Consider weekend closure
- Close to non-HOV traffic
- Close one direction of traffic

3.2.6 INNOVATIVE CONTRACTING/FINANCING

This Skill Set working group divided their discussion into five areas: financing, preconstruction, procurement options, delivery, and management.

Financing Options

- Joint use/joint development agreement such as decks/lids for income
- Tolls and managed lanes
- Other federal funds (HUD, USACE, EPA)
- Credit assistance for developers and cities who want to finance part of federal-aid projects (TIFIA, SIBs, Section 129)

Preconstruction

- Risk Management: Put responsibilities to the person best suited to handle the risk
- Consider special prequalification, thus ensuring contract has specialized expertise to perform work

Procurement

- Multi-parameter evaluation (i.e., not just low bid)
- Incentives/disincentives for minimizing traffic disruption such as lane rental; lane assessment for not opening lanes during travel time; development of a traffic control plan by contractor
- Utilities (allow third party agreements; put utility coordination into construction contract; consider outside utility coordinator contract)

- Warranties (pavement, use in conjunction with design-build)

Delivery

- Single contract is the best solution
- Preferred approach would be single-source design-build
- If design build not feasible, may need to go with hybrid approach: construction management with at-risk general contractor

Management

- Single TxDOT Project Management Team with possible assistance from consultants. Delegate authority to project team
- Performance specifications: contractor-developed traffic control plans
- Critical path schedule; create cash flow curve
- Bid escrow
- Change order plans (preset pricing)
- Lower retainage and bonding requirements for contractors

3.2.7 ROADWAY/GEOMETRICS

This group did not see any major problems with the schematic design. However, to reduce cost and construction time, the group recommended that TxDOT consider the following:

Reduce Vertical Clearance

- Consider vertical clearance of less then 16' 6" in some places
- This can reduce cost
- Minimize other design exceptions caused by maintaining 16' 6" clearance
- Makes drainage easier in some cases
- Reduces retaining wall heights
- Improve the mainlane grades
- Potentially reduces earthwork

Frontage Roads

- Build or improve the frontage roads early so they can be used as temporary mainlanes during construction
- Best if built first

Utilities

- Need investigation of and coordination with City of Dallas on the 96" sewer along IH 35E north section
- Have a single utility conduit for all utilities
- Assign a utility relocation project manager/coordinator

Pavements

- Use recycle material, crushed base or overlay
- Cover up existing pavement and use as part of base
- Best used where horizontal location will remain the same
- Reduce pavement criteria for the HOV section because of lack of trucks

Maintenance of Traffic during Construction

- Use HOV restrictions
- Encourage truck diversions
- Consider full closure for longer periods (weekends, etc.)
- Include media efforts to disperse information and conduct surveys

3.2.8 TRAFFIC/ITS/SAFETY

The Traffic/ITS/Safety skill set identified six types of strategies to accelerate construction.

Maximize Safety throughout Project

- Develop a comprehensive Safety and Health Plan for worker and traffic safety; traffic safety should include both public traffic and construction traffic
- Include a contract for wrap-up insurance for all parties
- Ensure worker safety by incorporating appropriate guidelines in project development documents, training workers, and adding an incentive for positive safety performance
- Ensure public traffic safety by providing additional traffic enforcement within construction zone, developing an education campaign with public service announcements, and using gawk screens
- Traffic safety in construction should include require coordinated work-zone plans to evolve with design, assure adequate access to/from work zones

Maintain ITS during Construction

- Coordinate early on utilities and fiber – try to install early or retain existing system
- Use high mast CCTV
- Consider "portable" ITS system at key locations if early deployment of ITS is not possible
- Identify and use other key corridors and arterials

Provide Traveler Information

- Use advanced Highway Advisory Radio
- Continually coordinate with media (TV, Newspaper, Internet)
- Assure 511 information-line implementation with dedicated service for project
- Develop web site with real-time information
- Consider event plans as examples of training and information (i.e., State Fair, Market Shows)
- Coordinate with AAA and other travel advisors such as MAPSCO and Mapquest
- Coordinate with trucking and freight companies
- Inform construction partners

Provide Coordinated Incident Management

- Identify a dedicated incident management coordinator
- Seek one-call response for investigation
- Obtain local stakeholder input (i.e., EMS, Fire, Police, hospitals)
- Place signs and markers along the corridor for easy identification of incident locations (by the construction date, GPS cell phones should be more commonplace)
- Disseminate traffic control plan to stakeholders and affected parties
- PIO/team should manage information
- Define the contractor's role in incident management
- Dedicate freeway service patrol to corridor
- Dedicate police/fire response within corridor

- Push for Dallas County Sheriff Patrol to provide incident management for corridor
- Write into the contract a set number of dedicated personnel to be hired from local police, fire, and towing services
- Encourage regional incident management training
- Push E-911 wireless

Provide Effective Traffic Control

- Build frontage roads first to use as alternate routes during construction
- Fast track Trinity Parkway and Woodall Rodgers (Spur 366) extension
- Encourage traffic to use IH 35W or IH 20 and IH 635 as alternate routes, especially for traffic not destined for Dallas; coordinate with other TxDOT Districts
- Investigate alternate routes to allow IH 30 to be closed; review scheduling and phasing to provide alternate routes
- Maintain a minimum number of lanes
- Investigate targeted night time and weekend closures by segment
- Utilize traffic analyses for contracting and financing with lane rentals and lane assessment
- Review past special events such as World Cup, State Fair, and Trinity Fest

Manage the Demand

- Explore options for increasing transit usage such as Bus Rapid Transit or additional express bus service; include support transportation by providing short-term vehicle rental and shuttles
- Provide subsidies
- Encourage employer programs such as flex-time
- Encourage carpooling and vanpooling
- Provide multi-modal connections and additional park-and-ride lots
- Maintain function of IH 30 and IH 35E HOV lanes to increase their usage
- Use extended temporary closures on weekends

3.2.9 CONSTRUCTION

Design Build

- Use Design-Build with one large contract
- If Design-Build is not possible, consider prequalification of contractors
- Allow the contractor to develop traffic control plan
- Involve the construction industry early in the design to minimize re-design
- Hire a PEF or contractor to perform a constructability analysis

Project Management

- Have one project manager and a senior management team (cabinet) for advising the manager
- Give review/approval authority
- Provide a 10-day turnaround on comments and reviews
- Develop a process for resolving disputes
- Develop QA/QC processes
- Use electronic document control
- Use CPM scheduling with bi-weekly updates

Construct Preparatory Projects

- Frontage roads
- Utility relocations
- Railroads
- Access improvement that can be addressed
- Alternate route improvements
- Reconstruction of bridges
- High Mast lighting
- Hazardous material remediation

Maximize Contractor Control

- "Loosen" specifications
- Give flexibility in material usage
- Flexibility in the traffic control plan
- More control of utilities relocation
- Staging areas
- Nested design-build gives contractor more opportunities to solve problems
- Alternate bid items

Evaluate All Traffic Minimization Alternatives

- Detours and temporary use of Trinity Corridor
- Alternate routes
- Non-motorized considerations for pedestrians and bicycles
- Remove or restrict trucks
- Close sections of the roadways for period of time
- Build the Trinity project first
- Close freeways directionally

CHAPTER 4

Next Steps

TxDOT will be evaluating the recommendations from each of the Skill Sets to determine which ideas or suggestions should be adopted for use during the remainder of the planning, design, and construction phases of Project Pegasus.

Additionally, six-month and one-year meetings will be coordinated with the TxDOT to assess the long-term benefits of the workshop and the extent of the implementation of its recommendations.

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APPENDIX B

Skill Set Descriptions

Skill Set Descriptions

- Environment – Scope-of-work and construction activities need to reflect environmental concerns to ensure the most accommodating and cost-effective product while minimizing natural and socio-economic impacts.

- Geotechnical/Materials/Accelerated Testing – Subsurface conditions and issues should be explored to assess their impacts on the project. Based on the geography of the project, subsurface investigation may be complicated by traffic volume, environmental hazards, utilities, railroad property, and right-of-way. Pursue options to expedite and facilitate turnaround times in material testing for material acceptance and contractor payment. The use of innovative materials should be explored and encouraged on projects to maximize the creative characteristics of the designer and contractor. By identifying project performance goals and objective, the designer and contractor have the maximum freedom to determine the appropriate methodology for constructing the project.

- Structures (bridges, retaining walls, culverts, miscellaneous) – Accelerating the construction of structures will require deviation from standard practices for design and construction and include early coordination between designers and contractors. A systems approach from the "ground up" will be necessary instead of emphasis on individual components. Prefabrication, preassembly, incremental launching, lift-in, roll-in, etc., are systems or concepts that have a proven contribution to accelerating construction and should be understood and receive priority consideration. Designers have several options in structure types and materials to meet design requirements, but identifying the most accommodating system while minimizing adverse project impacts should be the objective.

- Right-of-Way/Utilities/Railroad Coordination – Right-of-way, utility, and RR delays seriously impact accelerated operations. More innovative solutions are required for both short and long-term time sensitive construction projects. Right-of-way considerations include State laws and procedures covering acquisition and relocation, numbers and types of businesses and residences that may be impacted, ready availability of additional right-of-way, and sometimes, the number of outdoor advertising structures in the project area. Other items to consider are industry responsiveness, incentive-based utility agreements, corridor approaches to utility agreements, contracting for utility work, and non-destructive methods of utility relocation. When applicable, close railroad coordination is essential for a project for construction access or work impacting the railroad lines.

- Innovative Financing – Aligning the financing options with the goals of the project by matching anticipated cash flow with project management, while recognizing competing priorities for existing resources. Financing tools could include cost sharing strategies, tolling mechanisms, contractor financing, leveraging techniques, credit assistance, and cost management and containment concepts.

- Innovative Contracting – Explore the state-of-the art in contracting practices and obtain a better knowledge of how these techniques could be selected, organized, and assembled to match the specific situations needed on this project. Techniques to be considered include performance related specifications, warranties, design/build, maintain, operate, cost + time, partnering escalation agreements, lane rental, incentive/disincentives, value engineering, and any other innovative contracting techniques that would apply to the project.

- Roadway/Geometric Design – Highway geometrics can greatly impact project funds and integrity. Although designers may have several options meeting design standard requirements, identifying the most accommodating product while minimizing adverse impacts should be the objective.

- Traffic Engineering/Safety/ITS – Enhanced safety and improved traffic management by corridor contracting should be considered. Developing and evaluating contract models may illustrate the best use of incentives to enhance safety and improve traffic flow during and after construction. Evaluating both the construction and maintenance work may help assess traffic and safety issues more fully than the conventional project-by-project approach. Better information to the traveling public and politicians on the relationships among crashes, delays, mobility, total traffic volume, truck traffic volumes, and the need for lane closures during construction. Implement integrated ITS systems to communicate construction information to motorists via radio, Internet, wireless alerts, along with incident management systems/services.

- Construction (Techniques, Automation, and Constructability) – Accelerated construction may press the contractor to deliver a quality product in confined time frames and areas, while maintaining traffic. Completion milestones and maintenance and protection of traffic are key elements visible to the traveling public. Allowing contractors to have input on design elements that would impact time or quality during construction can improve the effectiveness and efficiency of the overall project completion. The use of automation to enhance the performance of construction equipment and contract administration should be explored and implemented.

- Long Life Pavements/Maintenance – It is feasible to acquire pavement designs with projected lives of 50 to 60 years by telling the contractor what is wanted, rather than how to build the pavement. By identifying and communicating the pavement performance goals and objectives for the pavement, the designer and contractor have the maximum freedom to determine the appropriate methodology. Explore the future maintenance issues on the project including winter services, traffic operations, preventative maintenance, and any other concerns that may impact the operation of the project features.

APPENDIX C

Skill Set Reporting Forms

Environment
Geotechnical/Materials/Accelerated Testing
Structures
Right-of-Way/Utilities/Railroad Coordination
Innovative Financing
Innovative Contracting
Roadway/Geometric Design
Traffic Engineering/Safety/ITS
Construction
Long Life Pavements/Maintenance

Environmental Skill Set

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Environmental		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
Stemmons Park Section 4(f) Properties **Constraint**	Sliver taking = 14% (0.67 ac), individual section 4(f) needed	· Design will provide avoidance minimization details for section 4(f) document-link to Design skill set · Need Mitigation · Bike/Ped Trail under I-35E at Stemmons Park and Oak lawn Ave. (land link option)-look into TxDOT policy · Trees (as enhancements) · Adjacent land purchase option south of Stemmons Park-Link to R.O.W. skill set · Dallas Tree Ordinance, Local need for a replacement for any trees impacted · Relocate Stemmons live oak trees to new 4(f) property-link R.O.W. and Design skill set
Trinity Parkway **Constraint** Southern Gateway?	Reliever route for Pegasus, capacity and timing issues	· City of Dallas proposal 6-4-6 lanes versus MIS 8-6-8 lanes recommended · What happens if we shut down the Canyon? · Timed closure/reduced tolls on Trinity to accommodate capacity · 11' lanes used on Trinity (issue?) · March 2012 potential Trinity opening affects start date of Pegasus · 2015 potential start on Southern Gateway · Link to project managers on adjacent project

Environmental		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
Historic Properties **Constraint**	Historic properties Bridge and Historical District	· Coordination time · Mitigation need for adverse effect · Structures group option of bridge over viaduct was eliminated
Hazardous Materials Issue **Constraint** (continued on the next page)	Environment assessments previously performed have identified relative risk areas. Use new data derived from Trinity Parkway project.	· Develop soil management plans developed for screening excavated soils to determine reuse or disposal · Develop groundwater monitoring of sump collection areas to establish baseline levels and monitor for changes to baseline levels · Develop contingency plans incorporating a decision matrix on handling the contaminated soils and groundwater as encountered during construction · Negotiate contracts for the disposal of highly contaminated soils and groundwater · Coordination with skill sets for needed space requirements of on site soil/GW staging areas? · Investigate new technologies for quantifying subsurface contamination in place?
Context Sensitive Design **opportunity**	Address urban design issues,	· 1% set aside = $7.5 million, additional money from green ribbon possible · Potential deck or lid over the canyon at - $25 million cost as an enhancement to the city of Dallas civic amenities–option to use lid as staging area first · Old Mill Creek open to surface view shed to mitigate water resource impacts if needed · City of Dallas options need to known ASAP (construction constraints) · Stream restoration and coordination time · Creative financing needed potentially SIB loans and TIFIA · Link to Design R.O.W., Design, Construction, Financing, etc

Environmental		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
Project **Opportunities**	Opportunities to enhance	· Putting a lid on the Canyon potential staging area for construction? · Raising Old Mill Creek prior to construction, if needed for mitigation · Mitigating Stemmons Park and linking it to the Katy Trail System · On upper Stemmons is the development and identification standards for the Dallas design district and for Hospital/market center area · For the Mixmaster area development of a portal gateway entrance to downtown Dallas · The creation of a transportation corridor wide signature setting for the gateway bridges over the Trinity river on I-30 and I-35
Socio-Economic Semi-resolved	Liquor stores, displacements of residential properties, EJ issues appeared to be okay	· Relocation assistance program
Old Mill Creek **Constraints**	City of Dallas options need to known (construction constraints)	· Nation wide permits · Stream restoration and coordination time · It is a probable Hazardous Materials issue due to early industrial sites · Limits the vertical profile of the Canyon
Noise (issue pending)	Residential Area exterior, Hotels interior	· Noise study needed · Noise barrier consideration · Reasonable and feasible
NWPs (issue pending)	Multiple permits may be necessary	· With or without PCN?

Geotechnical/Materials Skill Set

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Geotechnical/Materials		
Issue	**Idea**	**Implementation Details**
Accelerated Design Efficient Designs Efficient Construction Minimizing problems that cause design delays Minimizing problems, and costs, that cause construction delays and claims	Multiphase rapid site investigation beginning before the record of decision (ROD) is signed. Note: this is site survey and project feasibility work, and not design work. Therefore, it can proceed prior to the ROD. Work will focus on the following objectives: · Determining overall geotechnical site conditions and consolidating the project into common geotechnical zones (CGZ) with corresponding soil profiles and parameters for each CGZ. · Identify Problematic soil conditions - Soft Ground needing improvement - Contaminated Soil and Water - Expansive and High Sulfate Soils - Underground Creeks, Rivers, Voids, manmade miscellaneous fills and obstructions. · Begin evaluation of appropriate foundation	NOTE: The data collected and calculated, as outlined to the left, is not alignment or construction sequence dependent. It is a highly flexible approach, which will allow the rapid evaluation of multiple project scenarios. Also, this is not the total site investigation. **It is only the work to BEGIN prior to the ROD**. · Utilize all existing soil, environmental, and previous construction information prior to developing and executing the first phase site investigation. · First phase should primarily use rapid geophysical/nondestructive methods, cone penetrometer testing (CPT), Dilatometer Testing (DMT), and CPT derived soil contamination testing. · Using first phase data, execute second phase with limited high quality SPT and monitoring wells. · Implement a GIS data format compatible with the project plans.

Geotechnical/Materials		
Issue	**Idea**	**Implementation Details**
	alternatives (loads can be obtained from previous interchange designs). Cost, speed, environmental issues. · Begin evaluation of appropriate retaining wall types. Cost, speed, environmental issues, resolution of aesthetics issues, future additions to wall	
UTILITIES New and existing utilities including storm water drainage are a dictating factor in design and construction speed. They can be as important of a design consideration as an earthquake in terms of cost and time.	- Because they **inhibit** rapid construction, existing utilities need to be identified and removed as early as possible because of construction delays, cost of temporary shoring and support. - If you want the project to go fast, Utility relocation should not wait for all design work to be complete, or for construction to begin. The goal should be to have them moved before general construction contracts begin-as with the artery. Utility relocation should not wait until they are all resolved. Move what ever you can as soon as you can. - Mitigate impacts to 100-year old 96-inch brick sewer line along centerline of IH35E	1. Develop a schedule for utility identification. 2. Develop a detailed itemized list of utilities to be moved with a detailed schedule for relocation of each itemized utility-dates for issues to be resolved, who's waiting on who, when it is to be advertised. 3. Don't talk about it, get on with it. Put those involved with utilities at the top of the list to produce first. 4. Other Details - Early identification of conflicts with structures/foundations and other geotechnical features - Line it or bridge it over existing embankment or use lightweight fill

Geotechnical/Materials		
Issue	**Idea**	**Implementation Details**
Problematic Soils for Pavement Subgrades (Including Expansive Clays & High Sulfate Content Soils)	· Detailed geotechnical investigation including sulfate soil determination · Stabilization of thick subgrade layers · Sulfate soil stabilization	· Use of non-destructive equipment such as a GPR (ground couple) is recommended · New conductivity and colimeter tests should be used for the determination of sulfate content. · Use deep soil mixing techniques and massive soil stabilization · Engineering solutions with existing stabilization agents (lime and cement) or use new stabilization agents (Laboratory tests should ensure that the new stabilizers are effective)
Groundwater Conditions	· Find problems early in the design process and before construction · Water Table Elevations · Underground rivers/creeks (Canyon Section) · Contaminated water/soils	· Establish long-term automated groundwater monitoring program, using automatic data acquisition piezometers. This program should acquire data for at least one full annual cycle · Preliminary geotechnical investigation that identifies potential contamination problems if Phase I/Phase II environmental assessment not available or too broad · Sampling and testing contaminated water/soils using rapid in-situ tests · Establish a management plan that addresses the known and unknown contamination issues that might come up during construction. This process should start early on in the preliminary design process and can be refined as the design/conditions warrant.
Rapid Construction	· Bridges · Embankments · Lowering of grade under bridges · Accelerated design	· Foundation contracts preceding completion of final bridge design · **24/7 construction with lane-closing activities scheduled for minimal times of traffic** · Use of EPS blocks, geofoam and flowable fills at critical bottlenecks during project · Pre-cast pavement sections or support sections· · Multi-phased rapid site investigation beginning before record of decision is signed

Geotechnical/Materials		
Issue	**Idea**	**Implementation Details**
Phasing of Work	Coordinate wall design/traffic control development	Have traffic section and wall designer involved at beginning of design process to insure that both are optimized to minimize redundancy in construction.
Chapter 5. Retaining Walls Redundant or unnecessary walls for phasing of work add time to construction	Reduction of the need for temporary and/or permanent walls saves time Consider future loading conditions, road widening or park decks	Require coordination meetings between traffic planning, wall designers and geotechs, early and often in the project. Have independent review of plans at 30% and 60% design level for this issue.
Failure to plan and design for future expansion of adjacent facilities causes additional construction delays in the future	Consider future plans (i.e.; structure support, wall removal, future expansion of parks) during design.	Discuss and coordinate with all related agencies (including DOT) to determine future plans in area. Where feasible, design walls, bridges, and other facilities to handle these future facilities
Insufficient/ inaccurate ground survey can cause field modification of wall limits and redesign during construction	Obtain accurate survey and topographic information and accurately define wall limits and heights	· Obtain good initial survey/topographic information of existing conditions and supplement as needed during design process. · Identify cut, fill and cut/fill transition locations. · Limit slope in front of wall to 6:1 max, if possible. · Review anticipated wall limits for possible problems and make field view of areas prior to 60% and final plans

Geotechnical/Materials		
Issue	**Idea**	**Implementation Details**
Modification of wall foundations and details for changed conditions during construction causes delays	Obtain geotechnical data early in project and supplement as needed during design. (e.g., High groundwater table, soft soils and contaminated soils)	· Identify high water table, soft soils. · Identify contaminated soils. · Perform necessary laboratory tests to analyze short and long-term conditions and provide design parameters.
Inclusion of aesthetic treatments can cause delays to construction if not well planned and executed	Aesthetic treatments may have a profound impact on wall design, detailing, and construction.	· Resolve aesthetic treatments early. · Review affect of including treatments on construction schedule and sequencing (can discuss with Contractors/Suppliers, etc.) · Modify details accordingly if they cause excessive delays.
Efficient use of on-site materials can reduce waste and borrow	Large volumes of recycled concrete will be produced as part of this construction process and should be reused, if possible.	· Consider the use of recycled concrete · If used, establish specifications for use of materials

Structures Skill Set

Members:

Ray Fisher, TxDOT Dallas Bridge
Claude Napier, FHWA - VADIV
Gregg Freeby, TxDOT - Bridge Div
Ted Zoli, HNTB Corporation
Vijay Chandra, Parsons Brinkerhoff Inc.
Tony Okafor, TxDOT Dallas Bridge

Structures		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
1. Structure development report	Structure Types: Overpass Main lane Low level Mid level High level Retaining walls High Performance Material Corrosion Protection Strategy Foundation Requirements Maximize use of Standardized structures/elements Maximize use of Prefabricated structures/elements Consider preformed lightweight fill	Group bridges to maximize standardization. Coordinate with Geotechnical/materials. Construction integration. Consider manufacturing processes in design and construction.
2. Bid contract at 30% complete	Designer prepares Bridge plans to 30% with quantities +-20% Advertise and select contractor. Then contractor works with designer and owner to complete plans and construct project.	Innovative Contracting and Construction skill set coordination. Implements partnering at very early stage to benefit Owner, designer & Contractor. Designer of record follows through entire project. Implements contractor's means and methods. Creates win / win / win situation for owner / designer / contractor. Flexible for single or multiple contracts.

Structures		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
3. Prefabricated construction	Pre-cast Substructure: Abutments, bents, columns. Post tension elements together for continuity Pre-cast superstructure: Slab, girders, segmental boxes or prefabricated superstructure units	Prefabricated superstructure units require match casting
4. Construction techniques that minimize traffic impact	Incremental launching: Build bridge at one end and launch across at desired location. Lateral Slide: Build bridge adjacent to the existing structure. When complete, demolish old bridge and move new bridge into position Balanced Cantilever ~ Segmental construction. Heavy Lifts MOT / MPT	Incremental launching does not interrupt underlying traffic. Work can be done over traffic or with minimal stoppages.
5. Temporary Bridges	Use prefab modular bridges for temporary structures or develop standardized modular bridges.	Reusable, multiple uses reduce cost. Cost could be amortized over multiple projects. When project is completed, give bridge to county or city for bridge replacement. Could also be stockpiled for future emergency or security use
6. Demolition of existing bridges	Use crushed concrete as select backfill for MSE walls	Requires coordination with Geotech/Materials
7. Advanced Foundation Contract	Based on BDR determine foundations that can be constructed ahead of time	Coordinate with geotechnical skill set, Could save 6 to 12 months of construction time on large bridges
8. Pre-buy Beams	Have single designer develop all beam layouts and designs. Then Pre-buy all beams and supply them to the various contractors as needed.	Beam storage versus hauling 100 miles
9. Preformed lightweight fill	Expanded foam blocks combined with fill to speed retaining wall backfill	Also suggested by Geotechnical. Included in item 1.

Structures		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
10. Thru Girder	Pre-cast segmental thru girder sections post tensioned together	Ideally suited to narrow structures where vertical clearance is an issue.
11. Corrosion protection strategy	Need corridor corrosion protection scheme	Included in item 1
12. Non-peak construction	Close and replace structure over a weekend. (Friday 10:00 PM to Monday 6:00 AM) Replace structure at night (7:00 PM to 6:00 AM)	Coordinate with construction and innovative contracting
13. Move Interchange	Shift I30 / I35 interchange from split to a single location possibly above Houston St Viaduct	Disadvantage: Puts interchange above historic bridge ruining setting. Puts forest of columns in one of the proposed lakes of the Trinity Pkwy project. Impacts local access to city streets. Follow up discussion was provided on reasons for rejecting this alternative earlier in the project development.
14. Relocate UPRR1	Relocate UPRR away from downtown	Problems - requires cooperation of RR NO good location to relocate to Other side of Trinity is up for rejuvenation by City of Dallas, they would not like a RR there. Moving very far impacts low income housing.
15. Relocate UPRR2	Minimal shift in alignment to allow construction of new bridge parallel to the existing structure so that no temporary bridges are required	RR people tell us Stemmons RR Crossing needs to be 2 tracks - They propose shifting alignment to north and build new bridge on new alignment. We suggested using 300' truss Canyon crossing - existing pier is in center of HOV lane. Need to replace bridge- suggest using single span rather than multi-span for flexibility.
16. Durability	Design for durability, constructability, inspection and maintenance.	Select materials and develop details to enhance these concepts.

Right-of-Way, Utilities, Railroad Skill Set

Members:

Suku Banerjee, DART
Jesse Cooper, TxDOT ROW Division
Del Crouser, City of Dallas
Jane Deford, TxDOT Dallas
Kathy Facer, FHWA, HQ
Bob Frascella, Jacobs Civil
Robert Memory, NCDOT
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Doug Vollette, TxDOT Traffic Operations Division
David Walterscheid, FHWA
Janna Wampler, TxDOT Dallas
Scott Stockburger, TxDOT Dallas

Right-of-Way, Utilities, Railroad		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
Post Office	Federal Land Transfer - traffic circulation for their trucks; changing their truck staging area Avoid impact altogether. Change truck circulation	FHWA involvement at HQ level may be necessary to negotiate a transfer. May take up to 18 months to negotiate. Change design to avoid impact
2 residential, 21 displacements $26 M + Up to 150 parcels	Costs could be $75 M R/W, $300 M Utility, $15 M Railroads Early acquisition Use TTA authority, City or County of Dallas to do early acquisition Work with design to identify whole takes and partial takes where building is affected Identify and begin acquiring "critical" parcels for construction, staging/laydown areas	Recently passed legislation, need implementing rules from Austin for use on this project Start after FONSI Encourage early acquisition for hardship and protective buying
Utility adjustments of $150 M + Miscellaneous	96 inch sewer in median of I-35; substation at AA arena will go underground; fiberoptics. Looking for firm to assist TxDOT in utility agreements/coordination with design phase Consider location of new pilings, bents, etc. Need tangible timeline to seek FHWA authorization Need up to three years lead time for utility companies to determine impact on their facilities, reach agreement, design and relocate or include in highway contract Define possible exceptions to design	Utilities will be adjusted by road contractor as part of project or by one utility contractor Get firm on board for this project as pilot for TxDOT - firms are limited Utilize dedicated utility corridor for placement (culvert) SUE contracts Must establish ground rules for when a corridor is "full" causing some utilities to relocate to new areas outside of project right-of-way

Right-of-Way, Utilities, Railroad		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
	Utilize MOU with utility companies - need to establish what they want Establish time restraints or moratoriums for splicing telephone facilities May include options like 24 hour splicing Off peak hours for telephone facilities Use incentive/disincentive if utilities included in construction contract Allow TxDOT to acquire for utility corridors Utilize Trinity river corridor for utility culvert	Emergency services needs; can utilities be down for some periods of time? Share with construction and geometric design groups Cannot currently acquire for utilities, need legislation or some type of waiver? $10,000 per foot for buried transmission lines
Define utilities as part of the transportation facility	Enable TxDOT to better manage utilities on the R/W	Legislation needed
Info Mart	Significant lead time for adjustments Numerous fiber optics and others TxDOT receives $100,000 per year on rental of airspace under bridge	Allow several years notice to plan for reroute or relocation for highway construction Work with contractor to preserve/protect parking for Market
Utility adjustment	Seasonal usage needs to be considered	Electrical adjustments in winter, fiber optics and telephone in late spring/summer
Outsource acquisition contracts	Project specific Bring us the deed	One firm can handle 40 to 50 parcels 6 month process to get them on board Handle all aspects and deliver deeds Greater fee % payment for deed delivery, less for initial phases of acquisition process (retention to be used as incentive for completion on project basis)

Right-of-Way, Utilities, Railroad		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
Railroad	Stage DART bridge replacement over Canyon on falsework Demo and set new bridge during weekend outage Shoefly and rebuild the bridge Up to two years for RR agreements Early coordination Relocation of line on North end of Stemmons Build second track at the east side of the existing bridge Utility relocations up to one mile away for shoefly	Major temp easements and utilities within the RR corridors Historic bridge Requires advance planning with DART for service outage
Outsource Utility coordination contracts	Coordinate with utility companies, Hwy designers Prepare agreements, scheduling, billings, inspections, inclusion within construction contracts	Early planning meetings, SUE investigations, proposed location of facilities, investigation of conduits and corridors, oversight of utility plans
Right-of-way issues	TIMELINE Liquor license - where to move Adult entertainment uses? Billboard issues - legal locations Coordinate with design and acquire "just in time" for segmented construction Land consolidation/purchase of remainder properties Joint use with City that may be able to utilize remainders and allow ED on whole property Staging areas for Hazmat soils Firm up the R/W cost estimates	City zoning would come into play Dependent on funding - could shorten time considerably Must decide on construction schedule and phasing of project activities City needs to look at needs and enter agreement Look at whole take possibilities caused by damages for remainder size Reduce need to haul Utilize preliminary R/W map to begin activities
Carroll Avenue Staging Areas	Secure available property for contractor use as staging or laydown	Maintain ownership of current property
Parking	Affect parking significantly, acquire entire property as uneconomic remainder	Early acquisition and use for assemblage, staging or other public use Consider possible joint use agreement to mitigate parking impacts in highway airspace

Right-of-Way, Utilities, Railroad		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
Animal Shelter - SPCA	Begin relocation early; non-profit organization with limited funds to execute a successful relocation Explore whether funcitional replacement strategy would be applicable to this acquisition	Work with City and donors on alternate location with building to reduce costs Austin approval
Residential/Commercial Relocations	Begin relocations early, especially commercial Cohesive community? What impacts? Relocate within the community? Strong church affiliation DSS housing available?	Commercial moves may take up to two years Renovate other housing within community to meet DSS May have to renovate several homes Involve the preacher and church elders
Early acquisition of structures - voluntary acquisition	Offer to acquire early	Businesses willing to relocate early avoid construction difficulties Some businesses need extensive time for complex relocations
Loss of access	Taking of access rights without additional right-of-way. Closing drives with current access to frontage road.	Appraisal problems, need top notch appraiser Work with Attorney Generals office early
4f parkland acquisition	Acquire replacement lands for mitigation	Early acquisition of adjacent lands will aide the environmental document
Quick take	None allowed by TxDOT; only Toll authorities	Pass legislation to allow quick take on statewide or on project by project basis as approved by the Commission
Delegation of approval authority	Surplus disposals could be signed by District Engineer Approval authority for administrative settlements	New regulations needed - Delegation by Commission Approval of 10% over approved offer up to $100,000
Clarification of negotiations	Ability to continue negotiations after the filing of ED papers	Approval from Austin
Title Work	Incentive payment for title company to deliver commitments and issue insurance. Risk management - no title insurance needed for parcels under $20,000; limited title search to determine last owner of record	Legislative change TxDOT regulations change

Innovative Contracting/Financing Skill Set

Members:

Jerry Blanding, FHWA NRC
Charles Gaskin, TxDOT Houston
Jennifer Mayer, FHWA NRC
Wes McClure, TxDOT Dallas
Randy Pierce, Carter & Burgess
Sid Scott, Trauner Consulting Services
Rick Smith, Washington DOT
Juan Urrutia, TxDOT Construction Division

Innovative Contracting/Financing		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
Pre-Construction		
Total or Partial Closure	Close portions of freeway for periods of time longer than just overnight, to allow faster completion	Requires alternate routes - Trinity Parkway & Traffic Mgm. Plan in place to finalize. Extensive PR campaign
Environmental Constraints	Mill Creek must be raised before project can commence. Trinity Parkway project planned in advance of Pegasus.	ROD anticipated in 2007. This timing will affect choice of contracting methods.
Risk Management	Allocation and mitigation workshops	Conduct as precursor to development of RFP documents
Procurement Options		
Special Prequalification		Makes sense if D-B-B used.
Multi-parameter (A+B+...) Bidding	Bid both $ and time. Also, if applicable, bid traffic delay (differential travel time), quality, warranty, and other quantifiable parameters (A+B+C).	Delay, pay deducts. Improve, get a bonus. What about a good PR campaign, for instance, that reduces delay and allows the contractor to get a bonus? Also, what about delays related to accidents, fires, etc.?
Lane rental	Charge contractor for each lane closure	
Lane assessment	Allow night closures, but assess stiff liquidated damages if closure time exceeded	Difficult to monitor, but does get attention

Innovative Contracting/Financing		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
Incentives/disincentives	Incentives or disincentives based on: Opening of new lanes; Other open to traffic dates Opening ramps	
Long-term Warranties	Require warranties on specific elements of work (e.g. pavement life) Consider not requiring minimums like AASHTO, as they might limit innovation.	Acceptance by contractors is an issue. Bond to cover warranty is an issue, esal limits. Pay contractor later if warranty is not used? How to enforce warranty? Pay out from a retainage fund during warranty period. Might want to incorporate as part of other contracting method, e.g. Design-build.
Bid alternates	Alternates for items, or lump sum bidding	
Third party agreements	Statutes allow or require agreements w/ utilities, etc. Also possibility to use contractor to do work then utilities pay	
Raise Mill Creek in advance	Mill Creek needs to be raised, use as mitigation for other work. Once this is done, there is more design freedom for highway	
Delivery Methods		Depends on timing. Single contract makes most sense
D-B-B	Design-Bid-Build: Traditional low bid	Considered second choice if alternative methods not feasible.If multiple construction packages used, Get as much work done up front as possible (utility, alternate routes, etc.) before doing major construction packages
Construction Manager	At-Risk Agency	
Construction Manager/General Contractor	Contractor on board at PE phase, owner owns risk and design, but contractor helps with constructability	Viewed as a hybrid between D-B-B and D-B where contractor brought in at 30%. Use a GMP and adjust at final design.

Innovative Contracting/Financing		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
Design-Build	First choice overall. Several possible variations:DBOM, Design-Build, Design-Build-Maintain w/ annual payments for performance, etc.	Entire project or pieces? Need coordination with other projects, e.g. Trinity Parkway **Construction group favors one large D-B contract.** If not possible, then package low impact, up front portions (utilities, ramps, temporary structures) first, then do major project second.
Financing Options		
Tolls/Managed Lanes	Charge for access to some lanes - (not HOV, but general use) in order to subsidize the construction. Can incorporate variable pricing in order to manage demand/traffic flow.	Must cover cost of installing toll equipment, limiting access. May face public opposition due to perception of "Lexus lanes" benefiting higher-income drivers (especially since project occurs near low-income areas).
Public-Private partnerships	Private developer design, build, operate (maintain?) with reversion to state after payback and profit. Use of private equity could limit use of public debt to construct project.	Texas law may not permit concession. Public may oppose involvement by private contractor (making profit off of tolls on formerly-public highway, even if new capacity added).
Tax increment financing	City passes tax to fund portions of project directly benefiting or requested by city	City may have difficulty borrowing against tax increment (speculative source of revenue). Must identify district that will benefit from project.
Shadow tolls	Alternate means for paying contractor for construction and/or operation of project; based on road usage rather than completion or other metrics.	Does not actually bring net new revenue to the table; basically an alternate method of paying for project, but does not directly reduce costs.
Other Federal Funds	Seek funding for economic development and other project elements from other federal agencies, including the Federal Emergency Management Agency (FEMA); Corps of Engineers; Housing and Urban Development, and any other eligible grants. City/County of Dallas would probably take the lead on identifying, seeking, and managing applicable grant funding.	Grant funding may be limited.

Innovative Contracting/Financing		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
Joint development agreements	Develop some decks/lids and use proceeds to subsidize the construction of decks that do not have funding. Lease/sell ROW, where possible.	Must find suitable development opportunities activities (e.g., hotel above freeway). Cost of reinforcing deck/lid in order to carry the weight of a building may outweigh potential revenues from development arrangement. Must design fair process for development proposals/awards. FHWA rules on program income may require proceeds to be used on Federal-aid eligible projects.
TIFIA	Direct Federal Credit assistance under the Transportation Infrastructure Finance and Innovation Act; provides loans, lines-of-credit, and loan guarantees at an interest rate comparable to the interest rate on a Treasury bond of similar maturity. Loan repayment based on project needs, but can extend as far out as 35 years. Could be especially applicable to a joint-development opportunity with the city and/or with private developers. Comes "off the top" (no effect on Texas's Federal-aid funding).	TIFIA projects must be selected in national competition. DEIS must be circulated before application, and ROD or FONSI must be in hand prior to receipt of loan funds. City, county, and TTA could probably borrow at cheaper rates using existing bonding. (Developer may find TIFIA rates more attractive). Under current law, TIFIA projects must be at least $100 million (this project would easily meet this standard, as long as whatever element funded by the loan is considered part of the overall project). No more than 33 percent of eligible project costs can be covered by TIFIA loan (again, a standard that could be easily met if project is small component of $700+ million whole). TIFIA proposal in SAFETEA would lower threshold for assistance to $50 million.
State Infrastructure Bank and/or TIFIA	Low interest loans from state-capitalized bank. State can set terms, delaying repayment until up to five years after completion of construction, 35 years to repay, with low or no interest.	Depending on funding available from Texas SIB, could be useful for financing smaller pieces, e.g. city improvements, etc. Could be particularly useful for spreading out city contribution to project over time. Reduces city/county need to issue debt.
GARVEE bonds	Issue bonds against future federal funding - TxDOT law now allows borrowing in anticipation of Federal funds.	Policymakers must determine tradeoff between current investment and future repayment; cost of interest should not outweigh benefit of achieving project sooner. Other areas may perceive borrowing solely for Dallas area project as unfair.

Innovative Contracting/Financing		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
MANAGEMENT		
Performance Specifications	Specifications requiring end-result or performance rather than exact methods	Used either in conjunction with Design-Build, warranty, or other methods, or alone
Contractor developed Traffic Control Plans	Department sets performance requirements and contractors develop detailed plans	May be more problematic if multiple construction contracts used, but still possible to develop in framework of an overall traffic management plan.
Pre-set pricing for COs	Set a framework for pricing change orders, for extended time.	Allows predetermined pricing for change orders, but may result in higher contingency or overhead in general
Delegation of Authority for Cost to field	Speed decision making, keep job moving	
Partnering/escalation agreements		This is standard procedure for TX DOT but the team would like to add and support its use.
Bid escrow	Contractor puts all notes and calculations in escrow, in event of later disputes. Allows owner to see thinking at time of bid.	
Cash Curves	Use CPM to create cash flow curve; avoids over-extension of budget by tying payments to available revenues	Need to ensure that cash payment schedule does not deter rapid completion.
Bonding requirements	Consider changing bonding requirements so that more contractors can participate - bonding on high dollar projects can be difficult to get. Consider dynamic allocation of risk: at any one time, less than 100 percent of the project is at risk, so bonding requirement can be less than 100 percent. In CO, bonding requirement was set at 50% for parts of T-Rex	Need to balance lowered bonding requirements with protecting DOT against risks of non-completion (retainage or other strategies).
Risk Management/assessment	Develop explicit matrix to define risk and who owns in advance, to assign appropriately, and to determine where risk can most advantageously be held.	

Innovative Contracting/Financing		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
Change Retainage requirements	Lower retainage requirements so that there is not a large amount of cash withheld, so that bids may be lowered appropriately	If necessary can increase retainage if problems are anticipated
Set up allowances for contingencies expected in contract	Cover unknowns in advance, to limit bid amount	Owner, or project manager, owns authority to use contingency
Set up one TXDOT project management team	Single team manages project, using perhaps consultant help. Set up dedicated testing facility, if not Design-Build. (Design-Builder would handle if D-B). Team deals with configuration, cost, schedule, CO management, etc.	For D-B, team would delegate more responsibility to contractor and deal with higher level mgmt. issues.
Utility Coordination Contract	Either in conjunction with design-build contract or separately, hire external utility coordinator to identify, locate, coordinate, and negotiate agreements with all utilities in corridor. Manage information exchange between DOT and/or design/build contractor - so as design evolves, utility relocation is adapted. With utilities, engineer conduit that combines utilities, and lay out construction schedule that goes in logical order (successfully pioneered in the Texas Central Expressway). Cost of licensed utility inspector can be included as part of contract cost.	Utilities in Texas have a statutory right to occupy ROW; process is "first-come, first-serve." Utilities may not be willing to let work be done by contractor, or may insist on use of own contractor. Optimal solution may be conduit; cost of conduit could be covered by lease payments from utilities, but lease payments could be very difficult to negotiate.
ROW Acquisition Contract	Incorporate ROW acquisition into design-build contract; saves time by eliminating levels of decision-making - e.g., administrative settlements can be approved by giving contractor latitude to approve up to certain level; design issues can be resolved and ROW agreements made more quickly; contractor will acquire ROW rapidly due to incentives for timely completion in contract.	Works for parcels that can be acquired without legal action; DOT/contractor must allocate risks for parcels that cannot be acquired. Can TxDOT legally contract out for these services?

Innovative Contracting/Financing		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
Owner Controlled Insurance Program (OCIP) or Partner-Controlled Insurance Program (PCIP)	Wrap up insurance, so that DOT obtains overall insurance for project (or shares with Contractor), and bills contractors for premiums, eliminating need for individual contractors to seek (average savings of 2%)	Inspector General criticized Central Artery project for maintaining excessive reserve funds for its OCIP

Roadway/Geometric Design Skill Set

Members:

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Patricia Jackson, TxDOT DES
James Janovsky, TxDOT Dallas
Rory Meza, TxDOT DES
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Cheng Soong, CH2M Hill

Roadway/Geometrics		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
Weekend Closure	-48 hrs of continuous work, local street system alternatives - Only close portions	- Tearing up city streets, local traffic through lights. Special events, State Fair, American Airlines (Traffic Operations)
Existing pavement as a Base	- Use existing pavement as base, to reduce tearing out	- Not continuous for the proposed alignment (Roadway and Pavement)
Continuous Frontage Roads	- Frontage roads parallel to traffic to detour - For temporary divergence of traffic	- Lot of temporary roads may be necessary for this - Increased cost (Traffic, Construction, Design)
Truck traffic	- Dallas ties, or continuous through - Destination of the trucks? Detour only for short term - 8 to 13% truck traffic	Doesn't have to be entire project, can be only at points of construction (Traffic, Pavement, Construction)
Clearance	- 16.5 ft is not necessary? Try 14.5 ft, based on special consideration - Ramp design lower, weaving easier - 2% reduction ($14 mill, 2 months cut on time) - Drainage ability is increased with pipe slope	- Military prefer not to change, because machinery size is unknown for future. - May need special permission for 14' - 6" vertical clearance, which allows for 2-3" overlays on the roadway beneath the bridge - If there is a proper bypass, full clearance is not reqd.

Roadway/Geometrics		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
HOV only During Construction	- 80% traffic maintained - Encourage city have public use city streets instead of frontage roads (public relations) - Parallel service streets for weekends - Less earthwork, lower retaining walls, lower bridges, better profile grade	Using Different design criteria for HOV (Traffic)
Concrete Pavement	- Design of concrete thickness (HOV) conservative as is - May want to make thinner	Reconstruct, wasn't designed to handle traffic of trucks May be truck problem, but can toll and minimize truck traffic Thinner pavement fail quicker (Pavement)
Frontage Roads	- Most continuous is in the Canyon - Have along system, under utilized - May be able to use as through traffic? - Good coordination with city of Dallas	Difficult with so many interchanges Mostly for access to surrounding properties Diversion of traffic of wherever possible
Media Relations	- Public info - Start passing word to desensitize public of future - Monthly information share with property owners	Media Consultant few months before, sooner done better (Traffic Operations)
Prioritization	Which to construct first - Canyon, Mix Master, - Outside -> In or directional - Outside first get more room to work with - Building connecter,	Running through traffic, where to put columns Lots of temporary pavement Detailed sequencing plan to move things around (Roadway, Construction)
Project Manager Utilities	Several contractors, have a general consultant. Start during PS&E development, get them involved early as a penalty or incentive	Utilities want final plans, instead of preliminary Hurts their schedule, very critical about timing (Utilities)
Earth work	2 ft becomes 4 ft drop on level of bridge (if three different level) Ramp profile easier to design	But having the one substandard clearance automatically cause deterrent

Roadway/Geometrics		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
Clearance	Not every underpass profile has to have 14' clearance. May only need to do one or two May eliminate some of design exceptions	But having the one substandard clearance automatically cause deterrent
Pavement	Using it to mix with new as base or just overlaying the existing?	Canyon lower grade, how far going down and which part? (10ft) Need 4" cushion if overlaying
Involve Contractor?	Nothing but good things involved, maybe get a group, to come up with sequences of materials and pitfalls etc… Nobody's guaranteed the contract What can be done to shorten the construction time Get earlier input design Public meetings for contractors only Strategize	Don't want to be "too public" only top three or four probable contractors.
ITS (Traffic) Design	Conduit infrastructure? Designing a system into it Mounting cameras Construction can make set up of it	Implement with signing (dynamic message signs) ITS usually left out until very end - Use design consultant for P.S.&E.
Utility Design	- Conduit system created by design mesh with drainage - One location - 6x6 box culvert encasing utilities - Drill Shaft locations	Currently have 96" brick sewer culvert for sewage (wondering about design) Approx 100yrs old May need to encase not an option, in-situ forming is best Will it withstand the construction traffic, etc…. Expect $200 million adjustments
ROW/ Env	Section 4F, need avoidance and minimization for taking the parkland (0.67 acres)	Req. design details be submitted w/ Section 4F document
Traffic (HOV)	HOV during construction not feasible realistically	Even if 5 to 10% non-participation, purpose is to decrease traffic Alternate: so many single occupancy vehicles, try implement HOV throughout the project

Roadway/Geometrics		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
1. Vertical Clearance	In areas of possibility, may be an option Want someone to investigate Benefits may eliminate some problems	- Design exceptions to support this - Wall height reduced and increased bridge height, less earthwork
2. Frontage Roads	- Continuous frontage Roads early in process - For alternate routes of through traffic-If doing frontage roads, best if they are done first	Lots of temporary construction Difficult with so many interstate changes Mostly for access to local property
3. Pavement Design	- Prefabricate the pavement, only problem is aligning the joints - May be expensive, but it's quick - Need a straight section (limitations on curves) - Precast may save time - Varying the thickness	- Use as recycled material, crushed base or over lay, rigid pavement not a major factor - Can be part of depth of cover - Better if where horizontal location is remaining the same - Use only where possible - Using different design criteria for HOV
4. Utilities	- Having to design around non-removable 96" sanitary sewer pipe. - Utility constructed conduit considered in design - Has major financial implications, if fail major problem with public	- Maybe recommend coordination on one solution, deal with now or future - State memorandum of future complications - Mutual acceptable improvement scheme - If relocating, how much time added to project construction time
5. HOV and Truck Media	- Make the suggestion of trucks to take alternate routes - Some will avoid big city, others don't mind diverting if told in advance - If you're headed for Dallas don't, consider Houston	Create more HOV opportunities Overnight construction, longer window of Construction opportunity. Public Relations (survey of HOV users, would use as final design) maybe change driver patterns

Traffic Engineering/Safety/ITS Skill Set

Members:

Param Sankar, Cambridge Systematics
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Tim Fetters, Jacobs
Joel Fitts, Parsons Transportation
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Andy Oberlander, TxDOT-Dallas
Christopher Poe, PB Farradyne
Don Tolar, LaDOT

Traffic Engineering/Safety/ITS		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
1. Demand Management	Public education of available facilities, etc.	Behavior barrier
2. Demand Management	Shuttles to provide flexibility in multi-modal use	
3. Demand Management	Work with employers to use flexible work week strategies	Coordinate with "Pegasus 2" project
4. Demand Management	Increase park and ride area	
5. Demand Management	Increase bust route to transit for corridors that feed construction corridor	
6. Demand Management	Increase express bus service	
7. Demand Management	Carpool to shuttle to work.	Provide incentive to participating employers
8. Demand Management	Use lessons learned from special event management (fair, motor speedway, world soccer games, et.)	
9. Demand Management	Investigate use of partial and full HOV facility	
10. Demand Management	Extended temporary night time and weekend lane closures	
11. Demand Management	Build frontage roads first	

Traffic Engineering/Safety/ITS		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
12. Incident Management	Include locals emergency responders in TCP development and const. stage change	
13. Incident Management	Define who will respond to the various incidents in the corridor and include them in the planning	
14. Incident Management	Improve incident response time	Contractor responsible for clearing incidents. Clearly define contractor's role in incident management. Use towing specification - comply with Dallas towing truck rotation
15. Incident Management	Promote the Regional IM training	
16. Incident Management	Dedicated incident management coordinator	
17. Incident Management	Use state fair, apparel market, etc for training	
18. Incident Management	"One call" response for industrial and traffic accidents investigation.	
19. Incident Management	Provide for stakeholder input	
20. Incident Management	Way finder, reference markers, signing, etc.	
21. Maintain ITS	Coordinate funding with NTCOG to maintain existing or provide for rerouting	
22. Maintain ITS	Maintain ITS thru const.	Install Portable ITS system, hi mast CCTV, Statewide center two center ITS Control, deploy ITS in key corridors
23. Maintain ITS	Early coordination of utilities/fiber	R/W Utilities, SS

Traffic Engineering/Safety/ITS		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
24. Traffic Control	Reroute traffic from construction corridor.	Coordinate with Waco and Ft. Worth District, MAPSCO, MAPQUEST, and other traffic routing services to route around the corridor during const.
25. Traffic Control	Coordinate Work Zone and project development early	
26. Traffic Control	Investigate alternate routes for I-30 closures	
27. Traffic Control	Fast track Trinity and Woodall Rogers extension projects	
28. Traffic Control	Increased signing for internal traffic control	
29. Traffic Control	Lane rental	Innovative SS
30. Traffic Control	Traffic analysis for innovative strategies and scheduling; advance planning/design for route to handle diversion	Innovative SS
31. Traffic Control	Eliminate truck traffic unless deliveries in area	
32. Traffic Control	Maintain access to medical facilities	
33. Traffic Control	Maintain minimum I30 and I35E lanes thru corridor	
34. Traffic Safety	Use gawk screen	
35. Traveler Information	Provide time information to travelers	5-1-1 integrated or separated hotline
36. Traveler Information	Keep traveling public informed of construction schedule and work zones	Hire a Public Info person to coordinate public information campaign with media
37. Traveler Information	Develop local HAR radio system	Provide automatic override of local radio stations in WZ to give project information.
38. Traveler Information	Provide corridor activities to advise travelers of alternate routes	

Traffic Engineering/Safety/ITS		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
39. Traveler	Install additional DMS	
40. InformationTraveler	Provide truck traffic info	
41. Information	Electronic real-time update	
42. Traveler Information	Develop Web site with real time information	
43. Worker Safety	Train workers to understand accelerated technology to protect them - more equipment will be used than normal. 24 hr work schedule	Drug testing, physical testing, OSHA, weather, language, etc.
44. Worker Safety	Comprehensive Safety/Health program	
45. Worker Safety	Incorporate worker safety requirements in Project Documents	Incentive for safety performance
46. Worker Safety	Wrap up insurance	Contracting SS
47. Worker Safety/Work Zone	Develop information videos to show how to driver thru WZ for distribution to schools, churches, etc. to assist motorists.	
48. Worker Safety/Work Zone	Use checklist to check if safety features in place daily	
49. Worker Safety/Work Zone	Train trucker drivers, to improve internal work zone safety. Coordinate WZ staging with suppliers	Pre-qualify drivers
50. Worker Safety/Work Zone	Keep outside trucker informed of staging to improve internal traffic control	
51. Worker Safety/Work Zone	Speed Enforcement	

Construction Skill Set

Members:

Mufid Abdulqader, City of Dallas
Charles Brauer, TxDOT Construction Division
Steve Dewitt, NCDOT
Enrique Guillen, TxDOT Dallas District
Gene Hoelker, FHWA NRC
Joe Huerta, FHWA, NRC
E.T. McArthur, Montana DOT
Mike Lehmann, TxDOT San Antonio
Tony Payberah, TxDOT Dallas

Construction		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
Construction Staging (Sequencing Plans)	Room to Work Traffic Control Plans by Contractor Construction Staging Areas Maximize "out of traffic" improvements prior to impacting project-related traffic	Use existing public facilities as staging area in return for improvements (Park) Coordinate with IC, Traffic, Structure Skill Sets
Project Management Team	Project Manager Sense of Urgency Review/Approval Authority 10 day turn-around time Dispute Resolution Process Central Project Location (TXDOT & Contractor)	Will require high level wide ranging support to ensure issues are resolved! Coordinate with Innovative Contracting, design skill sets
Automation	CMP Scheduling Electronic Document Control	Coordinate with ?
Material Delivery	Pre-Order Materials Pre-Cast Materials Material Delivery Issues	Consider High Performance Materials Coordinate with Materials, structure skill sets
Availability of Materials	Aggregate Sources Cement Recycling?	Coordinate with materials, geotech skill sets

Construction		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
Sequence Smaller Projects of the overall project	Railroad Bridges Critical Ramps/Interchanges (Bridges) Frontage Roads Alternate Routes	Coordinate with Design, TE & safety, R/W/utility/RR, skill sets
Dealing with 3rd Party Problems Up Front	Utilities R/W Railroads Transit Access Hazardous Materials	Coordinate with Utilities, design (see above item)
Quality Control	Contractor Provided QC Inspection by Contractor Independent QA TXDOT QA Monitoring	Inspection by Contractor - Culture shift - "fox guarding hen house" Coordinate with materials
Relocate Utilities by Contractor	Contract to include movement of utilities by the contractor (water, sewer, power, cable, etc.)	Barriers - Industry Acceptance Coordinate with utility, design skill sets
Advance Utility Relocations	See #7	See above item
Industry Involvement in Constructability Reviews	Hire Outside Expertise for Reviews Contractor Constructability Reviews Hire PEF or Contractor to do reviews	Barriers - Industry Acceptance Coordinate with innovative contracting
Design Solutions by Contractor	Bid item - puts responsibility for plan error resolution on contractor and hired design PEF	Barriers - Industry Acceptance Coordinate with design, innovative contracting
Specifications	End Result - Means & Methods "loosen up" Opportunity to Innovate - review specs to allow maximum innovation	Cultural Barriers Coordinate with materials, Innovative contracting

Construction		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
Design-Build	Include utility movement, R/W procurement, Etc.	Cultural Barriers - it is never too late to go to DB!!! Coordinate with all groups!
Kentucky Pre-Qualification Process	Contractors involved in constructability very early in the design process - Special prequalification process	Limits Bidders - some may fall out by the time the project is actually bid - others cannot be added Coordinate with Innovative contracting, design
Best Value Contracting	Selection process very much like Design-Build but for Design-Bid-Build	Barriers - legal issues Coordinate with Innovative Contracting
Special Project Issues	Mill Creek Under Roadway Historic Bridge Covering Part of Roadway in Canyon Area	Need to be investigated much more in depth Coordinate with all groups!
Close short sections at a time?	Remove traffic in whole or in parts	Public Acceptance!!! Coordinate with innovative contracting, design, traffic & safety
Trinity Parkway	Reliever Route Constructed Prior to Pegasus	NEPA, Funding, Coordination Barriers
Work Force Availability	Inspection Forces Construction Workers	

Pavement/Maintenance Skill Set

Members:

John D'Angelo, FHWA - HIPT
Gary Graham, TxDOT Construction Division
Gerry Huber, Heritage Group
Mark McDaniel, TxDOT Construction Division
Abbas Mehdibeigi, TxDOT Dallas
Suneel Vanikar, FHWA - HIPT

Long Life Pavements		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
20 Years little to no maintenance. Expected pavement life more than 50 years.	This should be a low maintenance roadway with no base failures expected and surface failures experienced very infrequently.	Should be coordinated with materials, and construction technical experts
Composite pavements should be considered.	Various scenarios should be considered such as asphalt base\with CRCP on top (normal practice), CRCP on bottom with asphalt on top, precast/prestressed slabs with asphalt on top (at intersections and frontage roads, etc.). It is also possible to diamond grind slabs and not top with asphalt. If grades can be adjusted we can leave the existing pavement in place and bury it.	Composites get the benefits of the structural capacity of the concrete and the noise and ride of the asphalt. The asphalt insulates the concrete from temperature and moisture fluctuations. SMA with modified asphalt and open-graded friction courses should be considered as surface courses. Construction and materials experts should be consulted.
Materials selected to provide for quality product. Recycling of old concrete pavement should be maximized.	Do not use siliceous aggregates. Fast track material testing techniques should be used. Set up a separate pay item for curing to get a better quality product.	Subsurface investigations must be done. Consider more restrictive specifications to get higher quality materials. Coordinate with geotechnical and material testing groups. Possible uses of recycled pavement could be behind retaining walls, asphalt base courses, crushed aggregate bases, etc.

Long Life Pavements		
Idea (Short Name)	**Idea (Detailed Description)**	**Implementation Details (Barriers, Skill Set Coordination, etc.)**
Staging areas (crushing operations, concrete plant, etc.) should be on project site if at all possible. Permits obtained before letting.	On-site plant operations significantly reduce construction costs by eliminating haul distance and significantly reduces construction related traffic from surrounding roadway network.	If the floodplain is considered for plant operations, coordination with FEMA and COE will be required. Plant permits may be obtained by TXDOT in advance if the plant sites are designated on the plans. Protection of plant equipment and maintaining flow capacity through the floodplain are considerations. Right-of-way and environmental section should be consulted.
Restrict traffic through canyon section.	Consider such techniques as restricting all lanes to HOV traffic (reduction of lanes), weekend closures, complete shutdown.	TEXDOT traffic engineer should be consulted as well as environmental section. Could be publicly controversial and formal notification procedures would have to be carried out. This would affect environmental clearance. This could significantly expedite construction. HOV traffic can remain on a limited number of lanes while the others can be reconstructed.
Performance characteristics should be specified, regarding smoothness, friction, distress, noise, etc.	Performance warranties require detailed stress identification with monitoring cycles and techniques.	Distress has to be tied to existing pavement characteristics in a State or location. Also tied to typical deterioration curves and be truly measurable characteristics.
Long term warranties with contractor responsible for maintenance.	Long term performance warranties requiring contractor maintenance for approximately 10 years	This would require design build and tied with innovative contracting practices. Likely to result in innovative design and construction practices. Coordinate with contract administration specialists.