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Managing the Construction Bidding Process
A Move to Simpler Construction Plan Sets

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Mission Statement and Strategic Plan The mission of UTCA is "to advance the technology and expertise in the multiple disciplines that comprises transportation through the mechanisms of education, research, and technology transfer while serving as a university-based center of excellence."

The UTCA strategic plan contains six goals that support this mission, as listed below:

- Education – conduct a multidisciplinary program of coursework and experiential learning that reinforces the theme of transportation;
- Human Resources – increase the number of students, faculty and staff who are attracted to and substantively involved in the undergraduate, graduate, and professional programs of UTCA;
- Diversity – develop students, faculty and staff who reflect the growing diversity of the US workforce and are substantively involved in the undergraduate, graduate, and professional programs of UTCA;
- Research Selection – utilize an objective process for selecting and reviewing research that balances the multiple objectives of the program;
- Research Performance – conduct an ongoing program of basic and applied research, the products of which are judged by peers or other experts in the field to advance the body of knowledge in transportation; and
- Technology Transfer – ensure the availability of research results to potential users in a form that can be directly implemented, utilized or otherwise applied.

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A "State Planning & Research" Project
Funded By The

ALABAMA DEPARTMENT OF TRANSPORTATION

For Research to be Conducted Through
The University Transportation Center for Alabama

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16. Abstract

This project was conducted to determine whether construction plan sets could be significantly simplified to speed the process of moving projects to construction. The work steps included a literature review, a telephone survey of highway agencies in surrounding states, and a series of facilitated work sessions of stakeholders to seek simplifications. Unfortunately, the primary objective of this project was not achieved because breakthrough changes were not identified. However, positive overall results were obtained through the work sessions with stakeholders, which produced a list of more than 50 conclusions and suggestions. These were recorded, condensed, and sorted by topic for ease of use by the Alabama Department of Transportation (ALDOT).

In addition, the researchers developed several recommendations: 1- Study streamlining the total process from A to Z, not just the plan production step. 2 - Assess current traffic control plan criteria, designs and approval process. 3 - Assess current utility relocation plans and processes. 4 - Increase standardization throughout the process (place more items in Standard Drawings). 5- Utilize technology (electronic bidding, and Internet files for Specifications, Standard Drawings, and Standard Notes). 6 - Review the comments of stakeholders (elsewhere in this report) for concepts to incorporate into current plan sets.

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Executive Summary

The University Transportation Center for Alabama (UTCA) conducted a project for the Alabama Department of Transportation (ALDOT) to determine whether construction plan sets could be significantly simplified to speed the process of moving projects to construction.

The project utilized a literature review, a telephone survey of highway agencies in surrounding states, and a series of facilitated work sessions of stakeholders to seek simplifications. The first two work steps were not as productive as desired, providing the first clues that expectations of radical breakthroughs were not realistic. The third work step, stakeholder work sessions, generated a large volume of feedback; however, the comments addressed fine-tuning existing plans rather than major changes to plan format and content. Unfortunately, the primary objective of this project was not reached, because designers and contractors did not identify any significant changes in plan sets. However, positive overall results were obtained through the work sessions with stakeholders, which produced a list of more than 50 conclusions and suggestions. These were recorded, condensed, and sorted by topic for ease of use by ALDOT.

Following the end of the data gathering and work sessions, UTCA researchers made the following recommendations to ALDOT:

1) Streamline the total process from A to Z, from conception-to-completion. Total Quality Management techniques and construction project scheduling software are two techniques that might significantly reduce total time in the project delivery process.

2) Assess current traffic control plan criteria, designs and approval process. A thorough study might provide dividends in terms of reduced construction delays and improved traffic flow.

3) Assess current utility relocation plans and processes. It might be possible to reduce these delays though a comprehensive evaluation of utility permitting and relocation policies.

4) Increase standardization throughout the process. Examine whether typical designs can be developed for topics like beam bearing pads, and move them to the Standard Drawings.

5) Take advantage of technology. Electronic bidding, and Internet files for Specifications, Standard Drawings, and Standard Notes are examples of areas where time and money savings are already possible.

6) Review the comments of stakeholders (elsewhere in this report) for concepts to incorporate into current plan sets.

Section 1
Introduction

Objective

This project was a study of the basic tool in managing the project selection process, the role of construction plans and bidding documents. It was conducted to determine if the important documents could be modified by the involved parties to simplify and speed the process.

Problem Statement

The steps in contracting transportation projects are generally well defined and specified in Alabama Department of Transportation (ALDOT) documents. Likewise, the nature and extent of the desired construction is identified and defined through the use of plan sets, specifications and similar documents. These documents use standard terminology, standard numbering systems, and standard drawing types to make them easier to understand and to increase the probability of successfully transferring information from the owner/designer to the constructor.

Over time, transportation projects have become more complex and more difficult to define. At the same time, a much larger extent of activities is required of contractors. To compound the difficulty, many of today's construction projects involve rehabilitation and expansion of urban streets where capacity and safety have eroded. In other words, contractors are being asked to do more than in previous years, even when the right-of-way is crowded and existing traffic must continue to flow. Consequently, construction plans and associated documents have become more complex. They are time consuming and expensive to prepare, and time consuming and expensive for contractors to use. Yet, some extended collection of paper is necessary because all of the parties in the process have rights and responsibilities that must be defined from both engineering and legal viewpoints.

ALDOT wanted to take a fresh look at the process to determine if plan set information could be radically changed to simplify it. ALDOT engaged the University Transportation Center for Alabama (UTCA) at the University of Alabama (UA) to conduct such a project. UTCA proposed assembling a team of experts, isolating them, and asking them to concentrate on the process to improve it. This amounted to answering questions like the following:

- What works well in the current process? ... What does not work well?
- What are the minimum pieces of information needed to conduct specific types of projects?
- What are the least useful pieces of information?
- Do highway agencies in other states do it differently? ... Do it better?
- Could other media be used, i.e., Internet specs or drawings?
- Could on-line video plans be used (for example, monitors to show "layers" with plan view on one, notes on another, right-of-way on a third, etc) so users in the field could choose the appropriate information as they need it, in real time?
- What do individual contractors wish could be done?

Section 2
Project Work Plan

This project was a facilitated effort to synthesize the thoughts of managers of ALDOT, contractors, suppliers, and other stakeholders involved in transportation contracting in this State. It was a comprehensive effort to improve and simplify construction documents and processes, to identify the minimum information required to transmit the owner's desires when awarding contracts for construction projects, and to protect the rights of other parties in the high-risk environment of project bidding.

In simplified form, the major components of the project included the following work steps:

(1) Identify similar previous efforts through a literature review,
(2) Identify similar studies in other state highway agencies through a telephone survey,
(3) Conduct a series of facilitated meetings between the stakeholders,
(4) Prepare recommendations for changes to simplify and speed up the process, and
(5) Document the recommendations in a final report.

If the project successfully developed new plan set criteria, ALDOT had the option of extending it to conduct a pilot project (mock bidding exercise) for training of the involved parties, testing of the revised plan sets and bid documents, and evaluating whether the desired efficiencies were achieved.

Section 3
Project Activities And Results

The project started on January 19, 2000. The initial tasks concentrated on gathering background data through visits to ALDOT managers, a literature review, and a telephone survey. This was followed by a discussion session with the Board of Directors of the Alabama Road Builders Association, and work sessions at ALDOT headquarters with the Project Steering Committee (see Appendix A), or with both the Committee and invited contractors.

Literature Review

A traditional literature search was carried out using automated transportation databases (Transportation Information Research Service, etc.). Although there were ample documents in the database that addressed highway design processes, no previous projects or studies were located that directly addressed plan simplification. This effort did, however, imply that two related topics areas might be of assistance to ALDOT in controlling project design time:

(1) Addressing the entire spectrum of activities from conception to finished project through a comprehensive study, such as use of Total Quality Management (TQM) procedures or application of construction management software to the steps in the process, and

(2) Delivering plans and specifications through technology enhancements (Internet, etc.), using agency specific drivers and search engines that can screen huge volumes of information about a specific design to develop customized information for a designer or contractor.

The first topic might be of immediate use to ALDOT. The second topic might be of long-range interest as new technologies come on-line.

Telephone Survey

There were two components to this portion of the study. First, UA researchers contacted key individuals in transportation agencies and professional organizations. This included the Federal Highway Administration, the American Association of State Highway and Transportation Officials, the Transportation Research Board, and others. The calls were attempts to identify appropriate agencies or committees with jurisdiction over plan preparation issues. Questions were directed toward identification of similar previous studies, or suggestions of methods to simplify construction plan sets. In general, the survey was not productive; however, the respondents expressed strong interest in the findings of this ALDOT project.

A similar series of telephone inquiries were directed to state highway agencies in surrounding states. The target individuals were design engineers and "office" engineers (individuals responsible for moving plans through the bidding/award process). These calls were more helpful, because the respondents were aware of the plan-complexity situation and had given

prior thought to it. Although none of the agencies had conducted formal studies to simplify their plans, several had made attempts to reduce time-to-completion of projects. Typically, these steps involved lump-sum bidding, design-build projects, or some innovative activity for a specific project. As with the previously surveyed group, they expressed interest in the outcome of this project.

Work Sessions

The most useful portion of the project involved several facilitated meetings of stakeholders. Some of the meetings were limited to members of the Project Steering Committee plus their immediate assistants. Other meetings included the Project Steering Committee plus contractor or supplier representatives invited by the Alabama Road Builders Association and the Alabama Bridge Construction Association, at the request of the ALDOT Office Engineer. In all, 35 different individuals participated in the work sessions.

Typically, the sessions began with the UA researchers describing the nature of the project and the goals for the session—to look for ways to simplify plan sets and to shorten the time for plan production. Then, the conversation was steered through a series of topics to gather comments. Keep in mind that often the comments from one individual were counteracted by comments from another individual. For example, the contractor representatives made it clear that they did not think that lump sum bids were the way to shorten or improve the process, even though it had been mentioned frequently during prior conversations with ALDOT managers and during the telephone survey of DOT managers in surrounding states.

During the project, the Office Engineer Bureau requested copies of representative bridge plans from other state DOTs (see Appendix B). One of the most productive actions was allowing meeting participants to review them during the last two work sessions. This produced a fruitful round of comments.

Data Gathering Concludes

The initial steps in this project were not as productive as initially envisioned. The literature review and telephone survey did not identify previous studies of this nature and did not provide guidance about how to conduct the current project. As the work sessions proceeded, it became obvious why there were no previous successful studies—breakthrough steps to drastically simplify plans do not seem possible. Even though the current plan sets are complex, virtually every piece of information on them is useful to some individual at some time for some purpose during the design and construction of a project.

As the research progressed, Project Steering Committee members and UA researchers realized that the major objectives of this study would not be reached. However, the work sessions did yield useful information about plan set style and content, and it did help produce conclusions that could be useful to ALDOT.

Section 4
Findings From Work Sessions

The heart of this project involved gathering insightful comments from stakeholders about how to simplify the plan production process or how to save time in the process, without sacrificing quality. That information is summarized in this portion of the report in the form of feedback received (primarily from contractors).

It is important to recognize that a point raised during one of the group work sessions was very important to the person who raised it; however, it represented the view of a single individual. Often, the majority of participants agreed with the point, but that was not always the case. Bidding is a difficult, highly competitive process, and the plan types and plans details that are ideally suited for one bidder may be ill suited for another bidder. Likewise, processes that work well for ALDOT might not be the preferred choice of contractors or suppliers.

In the following paragraphs, those items that seemed to be most important to stakeholders and that were strongly supported by the majority of individuals in the work sessions are restated under the heading of "consensus items."

Feedback

During project work sessions, participants expressed the following main points about plan preparation, plan content, or plan quality:

- Previous ALDOT Study One contractor representative had participated in a previous internal study by ALDOT on this topic (plan simplification). He recalled marking sample plan sets to illustrate good items that should be retained, and poor or unnecessary items that might be removed.

- Quality A contractor representative who works in several states indicated that ALDOT's plans are among the best that he sees.

- Quality ALDOT was complimented for preparing good bridge plan sets. One contractor said it was very helpful that ALDOT plans are always in the same sequence and are easy to analyze. Plan makeup, quality, and order of assembly are usually good. Plan sets prepared for ALDOT by consultants are generally OK, but not as good as those prepared in-house.

- Quality A supplier indicated that the bridge beam sheets are easy to read and that they are the best in the southeastern states.

- Quality-Ease of Use Speaking of a neighboring state, one contractor said that their plans are much harder to use and require a lot of supplementary work on the part of contractors to find or produce information required to bid.

• Quality of Bridge Plans Compared to Consultants' Plans After reviewing samples of plans prepared by other state DOTs, meeting participants agreed that plans prepared by the ALDOT Bridge Bureau were generally better than plans prepared by consultants. Participants expressed a desire that consultants' plans be standardized.

• Quality-Major Overhaul Not Needed The general feeling among work session participants was that it would not be worthwhile to completely change ALDOT's current construction plans and specifications. But, there was a need to fine-tune them.

• Accuracy is Top Desire In general, contractor representatives at the meeting felt that their main concern was that accurate data be available on the plans in enough detail that they could prepare good bids. One contractor representative felt that in the past when plan sets became too simplified, key information was left out and problems occurred. Change orders, supplemental agreements, and similar issues were prevalent in this type of project.

• Bid Items-Token Amounts Work session participants agreed that contracts containing token amounts of bid items (just so the contractors could develop bid prices) were not in the best interests of the projects.

• Bidding-Electronic Internet bidding may become an effective way to handle this process in the future.

• Bidding-Problem Resolution One individual indicated that if a problem was found with a plan set during bidding, the situation became difficult. He did not think that the Department had a standard way to resolve such problems.

• Duplicate Information on Plans Extensive discussion was held on duplication of information in plan sets. In general, ALDOT desires to eliminate such duplication. The first example was that quantities are often shown on individual plan sheets, on box sheets, and also on quantity sheets. Errors can occur in the plan sets when a designer changes information in one location but forgets to change it in other locations. After discussion the contractors agreed that they desire to continue to show information in multiple locations. This allows them a way to cross check or verify their bid calculations.

• Earthwork Files-Contractor Access Georgia DOT (GDOT) provides their electronic files of project earthwork to bidders. This allows them to develop their own haul diagrams from GDOT's raw earth volumes, and to develop better bids. ALDOT was encouraged to look into this.

• Erosion Control Sheets Work session participants indicated that erosion control plans seem to have become much more complex.

• Legend Page ALDOT plans have a separate page full of legends. This is generally not needed; they should be moved to the Standard Drawings, although contractors did indicate that the complexity of the utility sheets might warrant a utility legend on them.

• Liaison Committee Should Provide Feedback An ALDOT representative indicated that he desired to have feedback from contractors about the way plans are produced and the information that is on them. After a short discussion, the group indicated that the "liaison committee" was the most appropriate group to provide this advice.

• Lump Sum Not the Answer? There was strong belief by contractors and agreement by other participants that lump sum bids are not the preferred way to simplify plan sets. This method is often inappropriate for certain types of work like Traffic Control Plans (TCPs) and erosion control. The contractors preferred unit price bidding so they could be more specific in estimating costs. The group learned that the Georgia Legislature recently passed a bill prohibiting GDOT from using lump sum bid items for certain items like TCPs.

• Notes-Complexity is Increasing An ALDOT representative stated that more and more notes were creeping into the plan sets. A note might have been added to cover some specific situation for a specific project, but that note became traditional and was never removed. If that type of note could be identified, it could be eliminated from future plan sets.

• Notes-Can ALDOT Indicate When They Change There are too many notes on the current plans. Contractors who are rushing to prepare a bid usually do not read each note in great detail. If they recognize the topic, they assume that the note is the same as the last bid letting. Can a way be arranged to show contractors when a "standard" note has changed? Perhaps this could be some special mark placed on the note for the first month or two after the change.

• Notes A contractor mentioned cleaning up the plan notes, indicating that some of them appear to be 100 years old.

• Plans Production-Print Both Sides? Florida prints bridge plans on both sides of a page to reduce the volume of paper. Work session participants expressed a dislike of this method.

• Process is the Problem After reviewing the plans, the contractors stated again that the big problem is not in the process of plan production, but in the overall design process. They suggested that ALDOT look at the process from A to Z, not just at the plan preparation steps.

• Process-Look Overall, Not Just Design In discussing ways to reduce the amount of time it takes to put a plan set together, contractors stated strongly that the current ALDOT plans were good and that the difficulty was in the process of preparing them, not the plans themselves.

• Project Closeout Contractors asked that this process be examined. It can sometimes require an abnormal amount of time. It can also lead to requests for information long after the project has closed out (for example, materials test certificates, etc.), and the information is very difficult to locate.

• Reference Point Data (BMs, etc.) One state did an excellent job of placing all of its reference point information on a single data sheet and contractors recommended this for Alabama.

• Resurfacing Plans Participants agreed that simple, proposal-sized plans are sufficient for resurfacing jobs.

• Reviews by Contractors During Plan Development A suggestion was made to periodically allow contractors to review plans that are under development. This might provide feedback to help ALDOT get better designs and to help contractors become more familiar with upcoming jobs. The contractors' professional organizations might take on the responsibility of holding such sessions.

• Review by Contractors The concept of a plan preview session was discussed at length. It might be possible for ALDOT to invite all interested parties to review plans at the plan-in-hand stage or at some intermediate point during the design. The Executive Directors of the Alabama Road Builders Association and the Alabama Bridge Construction Association indicated that their organizations might be able to host such a review.

• Review of Plans by Outside Experts One bridge contractor suggested that ALDOT hire an independent firm to review bridge plans to help catch errors before the bidding process began. An entire job could be reviewed including the plans, the utility information, the estimate of quantities, field visits, etc.

• Special Provisions-Consolidate Them The large number of special provisions and other documents included in each bid package creates a problem. GDOT consolidates all these and publishes a single book of supplemental specifications each year. For example, the GDOT 2000 supplemental spec book includes all the changes since the last publication of their specification book. This eliminates confusion and saves time for both contractors and GDOT employees. It might be a good idea to investigate preparing the same type of annual supplement for ALDOT.

• Standard Drawings Streamlining the plan production process was also discussed. Contractors suggested developing standard techniques and designs, and putting such information in the standard drawings whenever possible.

• Sequence of Work Participants discussed the sequence of work now shown on plan sets, and whether contractors should provide it instead of ALDOT. The general consensus was that ALDOT should continue to develop a sequence of work (if needed) since the designer has more time to study the problem than the contractor (or contractor's estimator) has.

• Streamlining-Concentrate on Whole Process, Not Plans A contractor representative stated that the real problem was not the plans and specifications. The way to save time and money is to streamline the entire process from beginning to end. The plan preparation is only the tail end of a long process. This would be a major research effort by ALDOT.

• Time-Necessary for Accuracy Participants drew the conclusion that accuracy is more important than plan simplification or time savings. It would seem that more accuracy would require more time for designers and reviewers.

• Time-Extra Time Needed to Bid Complex or Huge Jobs Contractors indicated that for certain types of jobs beyond a reasonable threshold (complexity or cost), the Mississippi DOT allows contractors to pick up construction plans two months before the bid date rather than one month. This would seem like a good idea for ALDOT.

• Time-Rush at End of Design An ALDOT representative thought that problems were sometimes generated at the end of a project when there was not enough time to complete a thorough design, so "catch all" notes were included in the plans to cover all situations.

• Traffic Control Plans-Time for an Overhaul It is probably time for ALDOT to conduct a study of traffic control plans (TCPs) to examine and improve standard drawings and procedures. It might also be time to consider whether a better process can be devised for approving changes to TCPs during a project.

• Traffic Control Plans An ALDOT representative indicated that TCPs have been a long-term area of difficulty, and the TCP sheets will probably continue to become more and more complex.

• Traffic Control Plans All parties agreed that traffic control plans offer high potential for problems. The notes sometimes do not seem to apply to a particular job, or they conflict with other information in the TCP. These difficulties are sometimes caused when an ALDOT Division adds its own notes to traffic control plans that were prepared by the central office.

• Utilities A contractor representative indicated that utilities remain a problem and that they are often a risky burden on the contractor. He recommended that ALDOT conduct a comprehensive utilities research project to develop better policies and procedures.

• Utility Plans Bridge contractors discussed utilities extensively. Utilities relocations seem to conflict with bridge construction, and to cause delays.

• Bridge Plans-Pedestals Beam pedestals were discussed. Contractors generally dislike them and preferred that step or slope caps be used instead.

• Bridge Plans-Anchor Bolt Wells A long discussion was held on anchor bolt wells. There was not much support for ALDOT's current policy of anchor bolts wells even though it was adopted to try to help contractors. Participants agreed that drilling boltholes was more desirable even if the Department required an extra piece of rebar, just in case one of the rebars was cut during the drilling of the bolthole.

• Bridges-Armour Plate Armour plate was discussed. Florida, Georgia, Mississippi, and Tennessee are experimenting with doing away with it, and ALDOT may want to do the same.

• Bridges-Box Sheets Support was expressed for the way South Carolina prepares its bridge box sheets. These were similar to drainage box sheets with the pay items across the top of the table. Each row of the table represented an individual structure.

• Bridges-Contingency Items A contractor suggested including a contingency item in bridge bidding. This would allow partial payment if additional work is required. Currently contractors receive no compensation for added items of work until a supplemental agreement can be negotiated and approved—which can take months or years.

• Bridges-Existing Bridges Included in Plans? Contractors indicated that putting drawings of existing bridges in the plan set was not always necessary, and that a good treatment might be to put such plans on the Internet so that they could be accessed if a need arose.

• Bridges-Footing Alternates Desired The issue of alternate footings was raised. Contractors would prefer that bidding include an alternate footing type for each bent. For example, if the plans show pilings for footings, a rock alternate could be bid. This would save time and effort if rock was encountered during construction.

• Bridges-Geotechnical Info A bridge contractor expressed a strong desire that ALDOT continue to include soil-boring information in the bridge plan sheets.

• Bridges-"Industry-Standard" Costs A discussion was held about developing "industry-standard" costs. Perhaps contractor representatives and ALDOT can get together to develop a procedure for establishing such costs. These would help when change orders occur or when difficult situations have to be addressed during construction.

• Bridges-Metric Plans The question of metric bridge plans came up. ALDOT indicated that ALDOT was no longer designing metric plans but that there were several completed metric plan sets that would be bid for the next year or so.

• Bridges-Skews A contractor indicated that plans sets for skewed bridges were much more difficult to analyze. He offered suggestions for improvements.

• Bridges-Standardize Details The topic of standardization received a lot of discussion. For example, there are only seven girders types but each girder in a plan set seems to have unique bearing pad dimensions. The contractors suggested establishing a limited number of standard pad designs and including this information in the "standard drawings" rather than have individual designs for each pad. The same type of discussion was held about standardizing beam designs. Currently there seems to be too many strand patterns, sometimes even within individual spans.

Consensus Items

Accuracy is Top Desire There was a strong agreement that accuracy was a far superior goal for plan preparation than speed or simplicity.

Changes (Major) Not Needed The work group did not see a need for major changes to plans and specifications, but did think that there was room for fine-tuning them.

Changes in Plan Info - Keep Track of Them It would help to catalog changes to specifications, standard drawings, etc. That way plan sets could refer to the specific dates of the editions applicable to the job to eliminate confusion.

Duplication Desired There is now some duplication of information in the plan sets, and contractors are in favor of keeping it as a way to "check" their bids.

Earthwork Files Access (read-only basis) to ALDOT's electronic earthwork files during bidding might benefit contractors.

Internet Put the specifications, standard drawings, and standard note sheets on the Internet.

Legends Remove the legend sheet from the plans and place it in the Standard Drawing Book (and on the Internet). The lone exception might be the utility sheets, which could be improved by putting a legend on them.

Lump Sum is Not Answer Contractors expressed a disdain for lump sum bidding as a way to simplify plans, but did indicate that there were other, appropriate uses for it.

Notes Contractors desire that ALDOT review the standard notes and project notes to clean them up.

Process Needs Streamlining, Not the Plans The preparation of plans is only the tail end of the process, and time and expense accumulates throughout the process. Attention should be placed on the early steps.

Quality of Highway Plan Sets The overwhelming majority of comments indicated that ALDOT plan sets have good quality, content and sequence.

Reference Data Sheet Put all reference point data, benchmarks, etc., on one or two sheets rather than putting the data for individual benchmarks on the sheets on which the benchmarks are plotted.

Resurfacing Plans Participants agreed that simple, proposal-sized plans are sufficient for resurfacing jobs.

Review – Contractors Desire Intermediate Review Contractors desire an opportunity to review plans as they are being developed. If a way can be devised to ensure fairness, it would allow ALDOT to get feedback during design and would allow contractors an understanding of the type of work coming down the line. It might be possible that contractor trade organizations or professional organizations could facilitate it.

Sequence of Work ALDOT should continue to develop a sequence of work (if needed), since the designer has more time to study the problem than the contractor.

Special Provisions-Consolidate Them Adopt the GDOT method of annually publishing a document containing all general special provisions.

Time-Reducing it May Not be Good The time required for preparing bridge plan sets is typically no more than six months to a year, which amounts to only a small percentage of the total project development time. The Department should study the process to streamline it by eliminating bottlenecks and by changing the process as appropriate. This will require a detailed analysis of the process.

Time-Extra for Bidding Contractors requested that extra time be allowed for certain categories of complex or large projects.

Traffic Control Plans All parties agreed that it would be helpful to rethink ALDOT's current traffic control plans and plan approval processes.

Bridges-Anchor Bolt Wells Eliminate anchor bolt wells and drill them in, even if additional rebars must be added in case the normal reinforcing steel is cut during the drilling process.

Bridges-Box Sheets Put all pay items in one location, like the South Carolina method. One big box on the box sheet could contain all bridge quantities for the job.

Bridges-Pedestals The contractors prefer that cap pedestals be eliminated in favor of stepped caps. If pedestals are necessary, pour them parallel to the skew. (That allows the contractor to give this info to the surveyor).

Bridge Plans-Quality Contractors like ALDOT bridge plans—this includes the makeup, quality and order of assembly.

Bridges-Rebar Tables Contractors have a general dislike for rebar tables and charts. They prefer bar dimensions on a bar detail sketch on individual sheets.

Bridges-Standardization Industry representatives pushed for as much standardization as possible, specifically mentioning bearing pads and beam designs.

Section 5
Recommendations

As the result of statements and suggestions made during work sessions conducted during this project, the UTCA researchers have prepared the following recommendations for consideration by ALDOT as a means to improve the plan development process.

1) Streamline Overall Process from Conception-to-Completion The production of plan sets consumes only a portion of the time necessary to complete a project. The majority of time is spent in moving a project through its early stages. A project to analyze and improve the entire process might be conducted using Total Quality Management techniques, application of construction project software to the project work steps, or similar techniques.

2) Assess Current Traffic Control Plans and Procedures ALDOT might thoroughly examine its TCP criteria, designs and approval process. This topic was mentioned often during the work sessions. This would be a big project, but it could reduce delays and costs associated with traffic control during construction.

3) Assess Current Utility Plans and Processes Utility delays were also mentioned frequently by contractors. It has been a decade since ALDOT's last major study of utility permitting and relocation policies. This would be another big project, but it also has potential for reducing delays and costs.

4) Increase Standardization Contractors made several recommendations of items that could be standardized to reduce future design effort and to simplify construction. For example, bridge designs now include multiple bearing pad designs, when a limited number of designs would probably serve the same purpose. Many other topics that could be treated similarly.

5) Take Advantage of Technology There appear to be some technology applications that have good payback, for example use of the Internet to display basic documents (Specifications, Standard Drawings, Standard Notes, etc.). Additional gains will be possible when ALDOT-specific search engines become available to gather project specific information for specific situations.

6) *Utilize Stakeholder Comments* Stakeholder work sessions generated over 50 comments and suggestions. ALDOT might review these (especially the consensus items) for suggestions to improve plan production and plan contents.

Section 6
Summary

The intent of this project was to identify and document ways to make significant simplifications to highway construction plan sets, leading to decreases in preparation time and cost. Unfortunately, that objective was not reached because breakthrough changes were not identified. No previous studies of a similar study could be located, and stakeholders could not identify that such changes were desirable in current ALDOT plan sets. However, positive results were obtained for the overall project through the work sessions with stakeholders, which produced a list of more than 50 observations and suggestions. These were recorded, condensed, and sorted by topic for ease of use by ALDOT.

The most important of these observations was that the entire process should be streamlined, not just the plan production portion (which is a minor part of the overall process). The UTCA research staff strongly supports this recommendation, and suggests that ALDOT proceed with such a study.

APPENDICES

A – Project Committee
B - Sample Plan Sets Acquired by ALDOT Office Engineer Bureau

Appendix A - Project Steering Committee

Dykes T. Rushing (chair)	ALDOT Office Engineer
Fred Conway (secretary)	ALDOT Bridge Engineer
Don Arkle	ALDOT Design Engineer
J F Horsley	ALDOT 3rd Division Engineer
Terry McDuffie	ALDOT Construction Engineer
Joe Bloise	FHWA
Bill Hughes	Hughes Investments
John McInnis	McInnis Corporation
Jack Newell	Newell Brothers Construction Co.
Tom Porter	Asphalt Contractors, Inc.
Mike Terrell	Scott Bridge Co.

Appendix B - Sample Plan Sets Acquired by the ALDOT Office Engineer Bureau

Alabama DOT

A-1	Ala 21 @ Atmore …	- turning lane
A-2	SR 157	- grade, drain, bridge culverts, partial base, and pave
A-3	US 278 add'l lanes	- partial grade & drain, base & pave, signing & bridge culvert
A-4	Bridge on US 278	- grade, drain, base, pave, bridge removal & bridge culvert
A-5	Ala 216	- grade, drain, base, pave and bridge
A-6	I-85	- pavement rehabilitation, guardrail, upgrading & clearing
A-7	Shades Creek G'way	- grade, drain, base, pave, bridges, signals, and landscaping

Florida DOT

F-1	SR 710, Okeechobee Co	- (Resurfacing, widening, drainage structures, etc.)
F-2	SR 45, Sarasota Co.	- (Bascule bridge, (major bridge, big plans)
F-3	SR 49, Gilchrist Co.	- (Asphalt pavement, resurface, widen, drainage, etc.)
F-4	SR 15, Putnam Co.	- (Grading)
F-5	SR 16, St Johns Co.	- (Intermediate bridge)
F-6	Co Rd 315, Putnam Co	- (Drainage, construction of sidewalk)
F-7	SR 95, Escambia Co.	- (Resurfacing)
F-8	SR 30, Santa Rosa Co.	- (Grading, recreation trail)
F-9	King High Park, Miami Co	- (Minor bridge replacement)

Mississippi DOT

M-1	Yazoo City	- Warehouse renovation
M-2	I-59 Jones Co.	- Interchange lighting
M-3	State project	- Renovation of weigh stations
M-4	SR 16	- (add lanes?, reconstruct? …)
M-5	I 20, Newton Co	- Bridge repair
M-6	Multiple routes	- Guard rail modification
M-7	Ms Hwy 15	- (Pavement rehabilitation/overlay ??)
M-8	US 45	- (Major job, big plan set, type of work??)
M-9	SR 28	- Bridge replacement
M-10	Covington Co.	- Overlay
M-11	Ellisville	- Traffic signal improvements

Tennessee DOT

T-1	Brick Church Pike	- Construction
T-2	Brick Church Pike	- X-sections
T-3	State Route 13	- Grade, drain, pave, sign, striping
T-4	SR 317 (Apison Pike)	- Drain, base, paving & structure
T-5	SR 106	- Grade, drain, sign & pave – construction
T-6	SR 106	- X-sections
T-7	Sharps Chapel Road	- Grade, drain, base, pave, bridge & guardrail
T-8	SR 153 [NH 153 (7)]	- Grade, drain, structures & paving (BIG plan set)
T-9	NH 153 (7)	- X-sections
T-10	State Rte 15	- Bridge repair

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