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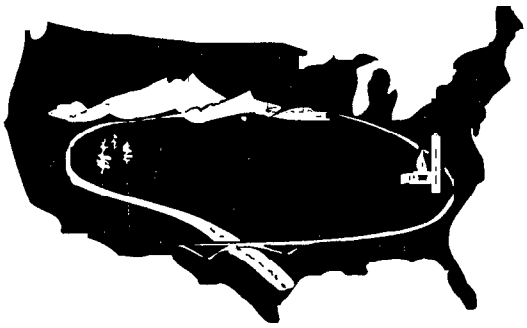

U.S.Department of Transportation
Federal Highway Administration

Federal Lands Highway

Federal Highway Administration
Department of Transportation

Contracting Out
Bench Marking Study
Phase 1 - Part 2 --- External Data Collection

The art of progress is to preserve order amid change and to preserve change amid order.

— Alfred North Whitehead

Prepared for the
Federal Lands Highway, Executive Quality Council
Date submitted
June 28, 2000, revised **September 25, 2000**

Submitted by
Mr. Eduardo Calderon, EFL; Mr. Rick West, CFL; Ms. Terri Jurkofsky, WFL; Mr. Howe Crockett, WFL; and Mr. Daniel S. Alexander II, FLH HQ

*"There is a distinction between the **word benchmark** and the **process of Bench marking**. The word benchmark comes from the geographic surveying where it means to take a measurement against a reference point.*

In the quality improvement lexicon, a benchmark is a "best-in-class" achievement. This

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FINAL FINAL FINAL

Executive Summary

Robert Greenleaf once quipped, "many attempts to communicate are nullified by saying too much." This philosophy has been adopted in the development of this report. The Contracting Out - Bench Marking Study Group has worked very hard in a short amount of time to provide accurate and timely data to support the Executive Quality Council's effort to collect data and report on the (1) the status of FLH current activities, (2) information on State/consultant activities, and (3) best practices identified during our effort.

With regard to the information on State/consultant activities, the team made an initial recommendation to the EQC which was approved with a few modification resulting in a final list of 14 State Departments of Transportation. Concurrently, the team developed a list of 16 questions and submitted to the states for response. Of the 14 states, we received 12 responses and visited 11 of them to discuss their responses and to establish a rapport for future bench marking efforts. Due to scheduling conflict, Illinois was not available to meet with us during the range of dates available.

It should be noted that the focus of this data collection effort centers around the following six factors specifically articulated by the Federal Lands Highway, Executive Quality Council. They are as follows.

- Level of Contracting Out - Identify what Preliminary Engineering and Construction Engineering functions are contracted out and compare to overall PE and CE budgets. Also compare engineering costs to overall construction program budget.

- Critical Mass - Identify the optimum number of personnel required to deliver internal and outsourced work. Identify staff mix, structure, and processes needed to optimize work output.

- Maintain Technical Expertise - Identify how an organization maintains Technical Expertise when they may be doing more contract oversight than technical work. How does an organization make decisions on which disciplines to maintain Technical Expertise in?

- Cost Effectiveness - Identify whether cost is an important factor in deciding whether or not to contract work out? Identify methods or processes organizations use to control, evaluate, and monitor costs.

- Training and Development - Identify the internal training an organization uses to educate their workforce when contracting out is a significant portion of their work.

- Other Factors (Quality, Liability, Efficiencies) - Identify efficiencies and methods used to ensure quality products and services, and to ensure contractor accountability.

Acknowledgments

Sign on executive's desk: "I know you believe you understood what you think I said, but I'm not sure you realize that what you heard is not what I meant to say."

It is so very difficult to properly communicate in this dynamic age. So a hearty thank you must be offered up to the Federal Lands Highway Executive Quality Council for their continued support and patience.

Each visit to a different State Department of Transportation or State Highway Agency or District Office was a challenge and a great opportunity. Many thanks to the numerous individuals that helped us collect the data we needed. In all cases our group was warmly received. Your openness and willingness to help is a tribute to your success.

From the Team Leader,

When the van pulled into the only remaining vacant campsite, everyone jumped out and began to work at a feverish pace. After completely unloading the vehicle and setting up the tent, two kids rushed off to gather firewood while the other two set up the camp stove and began setting out the ingredients for dinner.

"Gee," commented a fellow at the neighboring campsite, "you sure get some teamwork out of your family. I never saw anything like it."

"I have a system," the father confided. "No one gets to go to the bathroom until camp is set up."

Many thanks to the tremendous efforts of the Contracting Out Bench Marking Study Group. They worked countless hours and performed under very difficult conditions.

Daniel S. Alexander II

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Initial data received from states

Early in the year, Art Hamilton distributed an e-mail request for information regarding the levels of contracting out experienced by the State Departments of Transportation. The following is a compilation of the information received.

State	Notes	% Contracted
Alabama	Major part of design by contract (consultants. Also using a large number of consultants for construction inspection.	
Alaska	Construction contract administration Design Projects Misc.	10% 31% 0%
Arizona	A great deal of the highway design and construction work in Arizona is being done by consultants, contractors, and others.	
California	Due to a recent State Court decision against contracting out of engineering consultants, CALTRANS is now limited to contracting out for environmental activities and speciality work only. Specialty Work = Bridge Design Specialty Work = Experimentation/research of seismic retrofit.	
Colorado	Col. DOT has been contracting out significant amounts of project development activities in recent years, including environmental studies and documents as well as plans development. They are contracting out a growing amount of construction contract administration. For their FY ending July 30 1999, contracting out 51% of design and construction oversight	51%
Connecticut	Design Projects Construction Inspection	72% 61%
Delaware	Design Services Construction Management Services	60% 60%
Georgia	Design work Currently Georgia DOT does approximately 75% of their design work in-house, This is about to change rapidly due to funding increase in TEA-21 and losing personnel in retirement, GDOT will transition to more consultant design work. They have recently announced the formation of a new office to manage the consultant design work.	25%

State	Notes	% Contracted
Idaho	Design Projects	67%
	Construction Management	10%
Illinois	Illinois DOT expects to triple its consultant budget this year from $55 mi/year to $160 mil/year. Most of this is for Environmental and Design purposes. There will likely be an increase in construction engineering contract this year as well.	
Indiana	Environment studies	90%
	Design Projects	90%
	Construction Oversight	10%
	Maintenance	
	ITS area	
	All construction contracted - 6 million of force account construction	100%
Iowa	Construction Inspection	25%
	Very little is contracted in R/W.	
	Roadway design	62%
	bridge design	41%
	project planning(location and environment)	18%
Kansas	1990 - 97 Consultants did 71% of the plans and design work for the major highway and bridge jobs.	71%
	during 1998-99, the consultants did about 58% of the work	58%
	2000-09 program - consultants are schedule to do 70% of the plans and designs.	70%
	KDOT does have In-house crews that do the maintenance activities.	
	The reconstruction and major construction jobs are let to contractors.	100%
Kentucky	Professional Services - design, environmental studies, planning, underwater bridge inspection, photogrammetry...typical preliminary engineering items.	80%
	Construction	5%
note	Engineering and related services has grown from FY94 $39m to $68m in FY 99.	
Maine	Highway Design	30%
	Bridge Design	20%
	Construction Engineering	13%

State	Notes	% Contracted
Maryland	Plats	90%
	Field Surveys	33%
	Mapping	100%
	Design on a dollar basis	60%
	Design on a project basis	50%
	Construction	100%
Missouri	Highway Design	82%
	Bridge Design	16%
	Construction Inspection	0%
	Misc.	3%
Nebraska	Design engineering	35%
	Construction engineering	0%
Nevada	Most of the very large and very expensive projects are designed by consultants. NDOT will keep one or two bid projects a year in-house to keep their experience level up.	
New Hampshire note	Design Projects In-house is for smaller contracts - the dollar amounts of work performed by consultants is much higher than the number of projects. 84M (63%) of the total $134m 1998 prog. was designed by consultants.	33%
New Jersey	Design on a project basis	95%
	Construction	30%
New Mexico	Pavement Markings	100%
	Signing	100%
	Logo Program	100%
	Construction management on certain projects	100%
	Usual design services such as environmental, design and traffic studies	40%
Note	Study on outsourcing available.	
N Dakota	State portion of the $218 total construction program was: $161m of which $32 m was placed under contract for construction engineering services.	20%
	contracts for design services were issued on work that is estimated to cost $112 m when constructed.	50%
	County program was about $39m - all design and construction engineering done by consultant services.	100%

State	Notes	% Contracted
Oklahoma	Design work Construction Inspection Bridge Inspections	70% 10% 75%
Oregon	ODOT contracts out about $140m annually for all design and construction engineering services.	
Puerto Rico	The Puerto Rico Highway and Transportation Authority contracts out the majority of its preliminary engineering work including some construction management and design/build Management contracts for large transportation projects. Engineering Services	90%
Tennessee	Design Projects Construction Inspection (except for specialized work) R/W Appraisal work Environment studies	50% 100% 60% 60%
Texas	Preliminary engineering, including design construction engineering	51% 2%
Utah	UDOT currently contracts out 45% of its Design work UDOT does not contract out for construction inspection projects which are administered by UDOT.. Most local governments use consultant construction inspection services.	45% 0%
Washington	EIS Design is also often contracted The locals often contract out construction inspections.	
West VA	WVDOH does contract out for engineering services in many areas including preliminary engineering for environmental document preparation and contract plans, construction inspection, bridge inspections, materials inspection, and even some right of way services. Preliminary engineering design services Most NBIS inspection of major structures are contracted out to consultants. WVDOH has just started to use consultants for construction inspection in the last couple of years but that number is also growing. Most of the material inspection services provided by consultants, are set up as a statewide contract for special services. Increase in the about of right of way activities contracted out to consultants.	75% 10%

State	Notes	% Contracted
Wisconsin	consultant program is close to 50% of our deliverables. This includes both design and construction engineering services.	50%
Wyoming	15% of total design engineering (PE) $ are contracted out 1% of total construction engineering (CE) $ are contracted out 20% of total planning $ are contracted out.	15% 1% 20%

Letter of Transmittal

Analysis of the levels of contracting out provided a basis for selection of potential State Departments of Transportation for further study. The Executive Quality Council approved a list of 16 states including Florida, Connecticut, Tennessee, Maryland, Nevada, Oregon, New Mexico, Arizona, Kansas, Kentucky, Indiana, Illinois, Colorado and Delaware. A questionnaire and letter of transmittal were developed and forwarded to the 14 State Departments of Transportation.

U.S. Department
of Transportation

Federal Highway Administration

400 Seventh St., S.W.
Washington, D.C. 20590

Earlier this year, I sent an e-mail to (name) Federal Highway Administration Division Administrator in your State, informing him of the Federal Lands Highway Core Business Unit's desire and intention to conduct a bench marking study on contracting out. With your help, we are off to a great start. Thank you!

We are now moving into the data collection phase and would appreciate your hosting a visit from our bench marking study team sometime during the weeks of May 15 through May 26, 2000. The focus of our visit will be to meet with you and your staff to learn from your experiences with contracting out. We are especially interested in learning how you manage your consultants while maintaining an adequate level of internal expertise.

To help facilitate this effort, please respond at your earliest convenience with the name, phone number, and e-mail address of a point of contact from your office so a member of my staff can begin the process of making the necessary arrangements.

To assist in preparing for our visit, we have compiled the enclosed list of questions for you to complete. If at all possible, please provide your responses electronically to our study team leader, Mr. Dan Alexander of my staff, by April 28, 2000, at the following e-mail address: daniel.alexander@fhwa.dot.gov.

If you have any questions, please contact Mr. Alexander at 202-366-9482. Thank you for your assistance in our study.

Sincerely yours,

Arthur E. Hamilton, P.E. Program Manager, Federal Lands Highway

Enclosure

Federal Lands Highway - Contracting Out Study Questionnaire

Question 1: What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for preconstruction engineering services *(road design, bridge design, right-of-way engineering, right-of-way acquisition, right-of-way appraisals, bridge inspection, traffic engineering, geotechnical surveys, materials investigations, wetlands studies, archaeological/biological, landscape design, environmental, corridor studies, photogrammetry, feasibility studies, field surveys)*?

Question 2: What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for construction engineering services (*management, inspections, materials testing)*?

Question 3: Why does your Department use consultants?

Question 4: What was your Construction Program level in dollars for FY 97, FY 98, and FY 99?

Question 5: If your annual construction budget increases, would you hire more consultants, more in-house staff, or both? Why?

Question 6: Is maintaining in-house technical expertise important? If so, what methods do you use to ensure adequate levels of expertise?

Question 7: What types of consultant contracts do you use and what approximate percentage are they of the total number of consultant contracts annually for FY 97, FY 98, & FY 99?

Question 8: Does your Department have an errors and omission policy (yes/no)? Please explain why.

Question 9: Please describe your experience, if any, with reimbursement from consultants who have committed errors or omissions.

Question 10: How do you use in-house staff to procure consultants?

Question 11: How do you use in-house staff to manage consultant contracts?

Question 12: (a) Does your Department retain any portion of payments until consultant contracts are successfully completed (yes/no)?
(b) If yes, what percent is withheld and over what stages of completion does this apply?
(c) Is any interest paid on the retained amounts to the consultants?

Question 13: What methods do you use to monitor consultant progress between major milestones?

Question 14: How do you determine in-house costs when making comparisons to consultant costs for doing the same work?

Question 15: Are training costs included in your cost comparisons of consultants vs. in-house resources (yes/no)?

Question 16: Does your Department have training programs for in-house staff who provide oversight/management of consultants (yes/no)? If yes, please describe.

External Data from 14 States

Of the 14 states, 12 responded to our questionnaire. Of those states responding, 11 face-to-face interviews were conducted. The following contains a summary of our visit, complied notes and the answers to the 16 questions

Arizona
Interview Summary

On 5/26/00 the FLH Bench Marking Study Team consisting of representatives Howe Crockett, Rick West & Ed Calderon met in Phoenix, Arizona to meet with representatives of the State Department of Transportation.

ATTENDEES

•	Cathy Hegel	ADOT Engineering Consultants Section	602-712-8998
•	Dick Wright	State Engineer	602-712-7391
•	Bob Miller	ADOT - Statewide Proj. Mgt.	602-712-7545
•	Ken Davis	FHWA - District Engineer	602-379-3914
•	Susan Tellez	ADOT, Engineering Consultants Section	602-712-7720
•	Ron Williams	ADOT, State Construction Engineer	602-712-7323

We met for a three hours period, reviewing the purpose of the meeting, making introductions, briefly explaining how Federal Lands operates and then how the local Department of Transportation delivers their design and construction program – touching on both in-house and out sourcing issues.

REFERENCE MATERIALS

- Organization Chart - State Engineer
- FY 1998 Highway Program Monitoring Report
- FY 1999 Highway Program Monitoring Report
- Pending Consultant Contracts - Advertisements
- Engineering Consultants Section - Consultant Program
- Regional Freeway System - July 1999 Certification
- Temporary Technicians
- Active Project Statues Report - Design

OVERALL FACTS

- The current construction program is about $1.1 billion.
- About 30% of construction management is contracted out.
- The cost to the state is about 1.5 times higher when construction management is contracted out.
- About 90% of design work is contracted out.
- Loss of staff was the reason for the current level of contracting out.
- An average figure of 10% is used for PE.
- A 15% allowance is added to construction project funding for CE.

CHALLENGES

- Employees view the level and extent of contracting out as a negative. However, some see contracting out as a place to go in the future. They can learn from the state to be marketable with a consultant.
- Consultants pay much higher salaries which lures employees away.
- Salaries are frozen for 6 years and the legislature does not recognize cost of living raises.
- Construction staffing is 100 below the allotted FTE and there are 60 vacant design positions.
- The state has informed the legislature that core competencies can not be maintained with the current scenario.
- The state is not maintaining technical expertise
- Consultants tend to design "by the book" due to liability issues and do not employ much innovation.
- Contractors prefer to work with ADOT construction staff due to the "by the book" mentality of consultant construction management personnel and their lack of authority to make final decisions.
- State utility companies are having a hard time keeping up with all of this new work.

HIGHLIGHTED PRACTICES

- ADOT tries to bundle similar projects together for solicitation. Offerors must respond to the most difficult project. These proposals are then ranked. The first ranked firm then gets to choose the project they want.
- The state keeps the designer of record on through construction for design services, consultation, and problems and pays them for such services.
- The design consultant is required to provide and follow a quality control plan.
- The state is trying to employ lump sum design contracts to the extent possible, with the idea that the consultants will become more efficient in timely deliveries.
- Consultants must use the same software packages as ADOT.
- A 4 day project manager's course is open to both state and consultant employees.

- Project Mangers manage projects and do limited reviews but do not do technical oversight. The technical experts do technical oversight
- The state uses consultant project managers to manage other consultants.
- The state is updating their errors and omissions policy to make consultants more accountable.
- The state appears to employ good techniques for project scheduling and consultant control.
- ADOT uses inter-governmental agreements in order to use other agencies for design services and funds positions for other agencies in order to facilitate getting their projects through that agency's process.
- The construction section uses consultants to provide both full construction management and inspection services and to augment state crews.
- Consultant inspectors must be certified.
- An active Partnering program is maintained with consultants and contractors.
- ADOT may be challenged by a legislative committee on whether they can perform work as efficiently as the private sector. ADOT must then compete for the work. ADOT receives a 10% bid buffer against a private challenge. ADOT has not yet lost when having to compete. To date, this has principally been used in maintenance contracts.
- The non-valley program goes to the PM's who give the technical services the option of which projects they want to keep in-house.
- The state lets their people decide where in the organization they want to go. Some structures folks decided to go to design and visa versa. They feel that in order to keep their people, they need to be flexible with employee desires.
- Using FTE shortages to give remaining employees higher salaries.

Compilation of Interview Notes - Arizona

90% of design work goes to consultants.

1999 $1 billion program

Obligated $969 million and had $809 million in construction including CE costs.
The remainder went to designs, PE, R/W, and other such as innovative finance payments such as the state infrastructure bank.

Construction: $809 million includes a 15% allowance for CE and a 5% allowance for contingencies. Both consultants and the DOT are paid out of the15%.
Changes to the contract and incentives come out of the 5%.

Of the approximate $160 million remaining ($969-809) about $57 million was the cost for PE, R/W acquisition in 1999 cost $89 million and other expenses totaled $13 million

The $13 million went towards risk management costs (pay state Risk Management office a percentage of construction dollars for liability, funding for emergency repairs, and to the state infrastructure bank.)

1998: PE = $78 million, Construction = $668 million, R/W acquisitions = $73 million, and the other category = $70 million (This "other" category does not correlate to the 1999 figure of $13 due to different procedures.)

Currently have 182 open contracts at $1.1 billion contract value and have spent over $800 million of that.

Construction Administration: Consultants are used on jobs that ADOT does not want to deal with, don't have the staffing for, or are too remote. Projects in the more remote areas of northern Arizona are both wholly staffed and partially staffed with consultants.

Project Managers manage projects and do limited reviews but do not do technical oversight. The technical experts do technical oversight.

They use 10% of the construction value for PE expense for larger projects. This is generally too low for smaller projects. Freeway work PE is normally under 10% PE but does not include some work such as location surveys and other preliminary work.

ADOT does not have target goals for contracting out.

Have had a steady loss of engineers over the last 3 years. The legislature does not recognize cost of living needs, etc. They have 2-5% merit raises.

Arizona contracts out everything in the Phoenix metro area (Valley). The rest of the program goes to the PM's who take them to the technical services folks to see which projects they want too do internal. The leftovers are contracted out.

In 1981, the State did all their work internally. State employees see contracting out as a place to go in the future. They can learn from the state to be marketable with a consultant.

In 1992 and 1993, the government downsizing was taken very seriously by leaders in Arizona who decimated the ROW branch and cut roadway design in half.

The state does no ROW plans, appraisals, or title searches. They do some acquisitions.

There were big morale problems in '92 and '93. There are some morale problems today.

The only measures the state has for contracting out is its record of Program Delivery.

They contract out large projects by using competitive process, qualifications based.

Projects less than $200,000 are done by "on-call" consultants using task orders.

The state uses a combination of County and City engineers to assist them in program delivery.

The state sometimes wholly staffs construction project engineering with contract help.

The state decides which projects are wholly staffed by consultants by location and complexity.

Construction inspectors must have certification of skills. They used to use Nicet but now they use a training institute developed by the consultant industry and educational institutions to train both internal and consultant help.

An ADOT Resident Engineer oversees projects that are wholly staffed by consultants.

The length of contracts for construction services depends on the duration of the job. Shorter activities are done using on-call contracts.

They have 11 full-service contracts currently in construction.

They have 182 construction contracts @ $1.1 billion

Surveys - contract out everything except control surveys.
Mapping - contract out everything
Geotech - 2/3 contracted out
Hydraulics - mostly contracted out (They have 3 internal hydrologists)
Design - 3-5 design teams left, the rest is contracted out
Bridge - 50% contracted out statewide.

They use Primavera as their Project Management scheduling software

They used to use project templates but now they are used just as a guide. (The templates are not in the system). All projects are scoped independently.

They use separate update schedules to status their activities.

The states core management classes are in EEO, Affirmative Action, Ethics. They don't have a technical core management training program.

They have training in Project Management that is open to in-house and consultants. It is a 4-day training course for scheduling and technical managers.

They do several different types of consultant contracting including lump-sum, cost plus, and on-call contracts.

The way they contract work out is highly variable. They do piece-meal and turn-key type SOW's.

A consultant design resulted in a $150,000 drainage error at a Walmart store. The consultant paid for the error.

50% of all CCO's are due to errors and omissions. Many of these are no-cost CCO's.

Consultants are good for large projects, not so good for smaller projects.

Large projects might have consultants for Geotech, Surveys, and other technical areas.

The state has had a steady loss of engineers over the last three years. They give merit increases of 2-5%. They have had a
wage freeze for 6 years.

It cost 1.5 times for outsourced CE work versus internal costs for the same product.

The state is down 100 FTE in the construction department, currently 665 FTE ceiling. The overall fte in ADOT is 2300, with 60 vacancies in design. Using FTE shortages to give employees higher salaries.

They have told the state legislature that they can not maintain technical expertise at this rate (Number of FTE in design and construction)

80-90% of freeway design is contracted out.

ADOT has 5 design teams with 5-8 people per team. ADOT's structural branch has 20-25 people.

All Environmental work is contracted out. They have 10 specialists that oversee the technical work.

Contract oversight is continuous. They do not review stages of contract development such as 30, 60, and 90% PSE.

In-house design staff doing mostly overlay (3R) type work. They do not feel like they are maintaining their technical expertise.

ADOTs EITs stay about three years and then go to work for a consultant. ADOT works at keeping employees for 15 years (They feel if they keep them 15 years, they will stay until retirement)

ADOT also uses consultant PM's to manage consultant contracts.

ADOT tries to maintain a traffic services section as a core business unit.

ADOT competes with consultants by doing an independent government estimate for the work. Cost is not a factor in contracting out.

Loss of staff was the reason ADOT is at their current level of contracting out. This was not legislated. However, ADOT may be challenged by a legislative committee on whether they can perform work as efficiently as the private sector. ADOT must then compete for the work. ADOT receives a 10% bid buffer against a private challenge. ADOT has not yet lost when having to compete. To date, this has principally used in maintenance contracts.

ON two major construction projects, ADOT RE's are on-site with consultant staff. Consultant RE's must have ADOT concurrence on all decisions.

Consultant designs in construction: It takes ADOT Construction staff longer to get answers for consultant designed problems.

Construction changes/questions take extra time when consultants are doing CE because they have to get verification from ADOT.

Old ADOT employees are working with most ADOT consultants.

ADOT has an active partnering unit that maintains working relationships with consultants.

Consultants have inherent liabilities when doing work for ADOT, consequently, they are not making tough decisions without state concurrence.

ADOT keeps the designer on for consultation or design services through construction (post design services). They are on call for problems. The consultant is paid if they do post design work during construction. The same consultants are used over and over.

AGC has gone to bat for ADOT to try to get more internal oversight of construction work.

ADOT has done 4 D/B contracts. They are limited to 2 D/B contracts per year greater than or equal to $40 Million. The D/B firms are short listed to 3 -5 max. The non-successful bidders are given a stipend of 0.2%. ADOT keeps all proposals if they receive a stipend.

ADOT experience has shown that D/B's are quicker but more expensive and will be the wave of the future by legislation.

The state tried and used a mathematical solution for the distribution of workload. This did not work. They have no analytical method currently.

ADOT is paying for 5.5 FTE's of Tonto National Forest help and 1 FTE of BLM contract employee. These are done by MOU.

State utility companies are having a hard time keeping up with all of this new work.

Q3h - IGA (Intergovernmental Agreements) with cities, counties, developers, and the USFS.

Consultants are doing things by the book due to liability issues. The state is using it's design manual as "guidelines" in an effort to make the consultants think about design decisions.

Consultant liability - they make a lot of no-risk decisions. A geotechnical engineer, for example, drills everything.

State employees get a 30% to 40% raise when they leave ADOT to go to work for a consultant.

ADOT has a target goal for design(including hydraulics) of 7% PE. Mapping and Geotech are at about 3% PE.

30% of work outsourced on the construction side.

Traffic, Environment, Roadway Design, Geotech, all have on-call contracts.

On Calls: Roadway contracts limited to a $200,000 maximum fee. Construction contracts are limited to a $300,000 maximum fee.

State has to rotate on-call contractors with no guaranteed minimums.

ADOTs on-call contracts are 1 year contracts with options to extend for 1 year twice (3 years maximum)

ADOT trying to go with lump-sum contracts. They feel that consultants want to make more money and this will drive efficiencies in their contracts.

The efficiencies they are driving for are time efficiencies. They have not seen any time improvements with CADD versus the old drafting methods.

ADOT requires consultants to use the same software packages as ADOT uses.

ADOT is using Contractor staking, aerial surveys with supplemental ground surveys. State pays final quantity in the PS&E package (Plan quantities)

Q5 - ADOT schedules using +/- 60 days from the data date. Report shows all activities within this time frame. They show start/stop dates and remaining duration (They do not use % complete)

Raw data goes back to the Project Managers and the technical functions. If nothing is reported, the activity is flagged.

ADOT has one meeting per month. All PM's, technical leaders and workers attend this meeting.

ADOT has an "Active Project Status Report - Design" This report is updated monthly and incorporates consultant projects also. Consultant projects are required to submit scheduling data using a system compatible with Primavera, P3. Schedules are developed by either consultants or 3 in-house scheduling personnel (2 of these are contract people). This reports tracks the following:

Project Number, Name, Location, PM, phone number, Consultant, Route, District, Lane Miles, type of work, Program Cost, Milestone activity dates including; PDC, LSD, Kick-Off, Mapping/Surveys, GS, VA, M/M, Environmental Clearance, R/W clearance, U/R clearance, Traffic Control Plan, Planned and Actual stage 1- 4, Planned B/A, and comments.

ADOT reviews consultant PS&E's for scope and guidelines, NOT for technical accuracy.

Bob Miller is the leader for the STATEWIDE Project Management group. His group has 15 PM's. 4 of these PM's are senior (PM-3). They are mentors for other PM's and do administrative oversight. They handle 2-3 large projects ($30 to $40 million complex projects)

PM-2 - Registered Engineers have 2-3 large projects that are less complex, 6-7 smaller projects, or 40 pavement preservation projects.

PM-1 - Non-Registered Engineers, 1 D/B project at $44 million.

ADOT has a Valley Transportation group (For freeway design) that has 7 -8 PM's. Currently 3 PM-3s and 4 PM-2s. They manage major project corridors and work using A/E's for PS&E's..

ADOT also has an Operations branch that does construction and includes the districts. They also have a Partnering, Management Budget & Training, and Transportation technology group.

CONSULTANTS RESPONSIBILITY (Standard clause in ADOT contracts)

"The CONSULTANT has total responsibility for the accuracy and correctness of plans and related data prepared under the terms of this CONTRACT, and shall check all such material accordingly for completeness, missing items, correct multipliers and consistency. The plans will be reviewed by ADOT for conformity with ADOT procedures and contract terms. Review by ADOT does not include detailed review or checking of design or major components and related details or the accuracy with which such designs are depicted on the plans."

Freeway projects have consultant construction administration staff that is approved by ADOT and must remain on the project unless ADOT approves changes.

An ADOT Resident Engineer (RE) monitors the project and has authority for changes. The consultant construction RE must seek approval from the ADOT RE.

ADOT does not provide any training for consultants. Many consultant construction administration staff are former DOT employees or they have worked on previous ADOT projects, so they are very familiar with state procedures.

ADOT approves the consultant's CE plan for staffing and oversight. They also approve any changes to it. ADOT listens to consultant input but in end decides what they must have on the project.

RE or District Engineer always has oversight.

Contracts require consultant inspectors to be trained and certified.

Temporaries and on-call employees have 1 year terms extendable to 2 years. If a project is for total construction administration, the term is for the length of the project.

Consultants are tougher (not flexible on contract specification interpretation) on contractors.

The AGC has lobbied the legislature for higher salaries for DOT employees, because contractors don't want to work with consultants.

The AGC also thinks consultants want to drag a contract out but they are cost plus fixed fee, so the consultants would not get extra profit that way. They would only would get

labor costs. ADOT feels that they are only trying to please ADOT so they will receive the next job.

ADOT staff handle numerous projects in the rural areas. Consultants have only one job to concentrate on.

Consultants usually have more people on these projects than ADOT does.

ADOT tries to bundle similar projects together. Offerors must respond to the most difficult project. These proposals are then ranked. The first ranked firm then gets to choose the project they want.

Internet Advertisement site that is updated weekly showing pending consultant contracts and selections.

Engineering Consultants Section Consultant Program (executive summary of what they do)

Chart of numbers of Temporary Technicians and on-call construction administration projects.

Map of Valley Project Routes and projected life cycle costs and planned construction costs.

Accelerated Program for the Valley Regional System - Status Report updated monthly.

YTD Total Construction Program Summary

Cost Adjustment Construction Summary.

State Responses to Questionnaire - Arizona

Q - Question ***A - Answer***

Q 1: What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for preconstruction engineering services (road design, bridge design, right-of-way engineering, right-of-way acquisition, right-of-way appraisals, bridge inspection, traffic engineering, geotechnical surveys, materials investigations, wetlands studies, archaeological /biological, landscape design, environmental, corridor studies, photogrammetry, feasibility studies, field surveys, hydraulics and research)?

A 1 Information pertaining to Question 1,2 and 4: Difficult to answer as questions are presented. Following is some information which is readily available;

Five-Year Program Dollars
1997 768 Million

1998 1 Billion Obligated 890 Million of which 668 was Construction
1999 1 Billion Obligated 969 Million of which 809 was construction

Professional and Outside Services
Fiscal Year 97 $48,796,942
Fiscal Year 98 $70,062,617
Fiscal Year 99 $80,680,669

Unable to breakdown into categories indicated in Question 1 and 2. Please feel free to give me a call if you have questions or if I can help clarify.

Q 2: What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for construction engineering services (management, inspections, materials testing)?

A 2 Information pertaining to Question 1,2 and 4:Difficult to answer as questions are presented. Following is some information which is readily available;

Five-Year Program Dollars
1997 768 Million
1998 1 Billion Obligated 890 Million of which 668 was Construction
1999 1 Billion Obligated 969 Million of which 809 was construction

Professional and Outside Services
Fiscal Year 97 $48,796,942
Fiscal Year 98 $70,062,617
Fiscal Year 99 $80,680,669

Unable to breakdown into categories indicated in Question 1 and 2. Please feel free to give me a call if you have questions or if I can help clarify.

Q 3 Why does your department use consultants?

A 3 The State of Arizona is on of the fastest growing area in the United States. The Phoenix area alone is expanding at a rate in excess of 90,000 people per year. A number of years ago, the Department of Transportation realized that it could not keep up with the transportation needs of this expanding population without increasing its technical resources. The number of technically trained individuals needed were only available in the private sector. Since that decision was made, ADOT and the Consultant Community have developed a close working relationship focused on meeting the needs of the traveling public.

Q 4: What was your Construction Program level in dollars for FY97, FY98, and FY 99?

A 4 Information pertaining to Question 1,2 and 4: Difficult to answer as questions are presented. Following is some information which is readily available;

Five-Year Program Dollars
1997 768 Million

1998 1 Billion Obligated 890 Million of which 668 was Construction
1999 1 Billion Obligated 969 Million of which 809 was construction

Professional and Outside Services

Fiscal Year 97 $48,796,942
Fiscal Year 98 $70,062,617
Fiscal Year 99 $80,680,669

Unable to breakdown into categories indicated in Question 1 and 2. Please feel free to give me a call if you have questions or if I can help clarify.

Q 5: If your annual construction budget increases, would you hire more consultants, more in-house staff, or both? Why?

A 5 The construction program has increased due to an effort to accelerate the development of the urban freeway system. To accomplish this increase in program and the accelerated delivery schedule, ADOT has turned to the consultant community. The reasons are the same as provided in the response to question three above

Q 6 Is maintaining in-house technical expertise important?

A 6 In-house technical expertise is important. ADOT has undertaken a number of efforts to ensure the continuation of its core competency. In order to attract and retain technically trained staff ADOT has developed an alternative pay schedule for Engineers and Technicians that is more closely aligned with the private sector and other local governments. ADOT is developing a Technical Training Program, and staffing each area with a Training Coordinator. In addition, the State Legislature has established a list of core management training classes that are mandatory for all supervisory staff.

Q 7 What types of consultant contracts do you use and what approximate percentage are they of the total number of consultant contracts annually for FY 97, FY 98, and FY 99? .

A 7 ADOT uses a variety of consultant contracts. These include:

Design – at the Consultant's facility.
Design – on campus using contract employees referred to as Supplemental Services.
Design – on- call services in a number of specialty areas such as Traffic Engineering, Surveying, Roadway Design, Geotechnical Engineering, and others.
Design – Management Consultant Services project development to 30% completing using a Prime Consultant and a variety of sub-consultants.
Construction Oversight – on site contract administration.
Construction Oversight – on-call services.

All of these consultant contracts are qualifications based selection. Most are paid by cost plus fixed fee, and some are paid by lump sum.

Q 8 Does your Department have an errors and omission policy? (Yes/No) Please explain why.

A 8 ADOT maintains an errors and omissions policy in order to ensure that the product provided by it consultants is appropriate to the needs of the agency. The three fundamental principles of this Agency are "Focus, Alignment, and Accountability". The errors and omissions policy serves to reinforce the accountability leg of that triangle.

Q 9 Please describe your experience, if any, with reimbursement from consultants who have committed errors or omissions.

A 9 ADOT has successfully pursued claims against consultants or their insurance carriers for errors and omissions that are discovered during the course of construction.

Q 10 How do you use in-house staff to procure consultants?

A 10 Under the general direction of the Assistant State Engineer for Engineering Technical Group, ADOT maintains an office dedicated to the procurement of Consultants. That office is the Engineering Consultants Section and they are a team of Contract Specialists with expertise in consultant procurement.

Q 11 How do you use in-house staff to manage consultant contracts?

A 11 ADOT maintains two Groups dedicated to managing consultants. These are the Valley Project Management Group, responsible for projects in the Phoenix area, and the Statewide Project Management Group, responsible for projects outside of the Phoenix urban area. In addition, there are project managers in the Roadway Group, and other Groups who have the responsibility of consultant oversight.

Q 12: Does your Department retain any portion of payments until consultant contracts are successfully completed? (Yes/No)

A 12 NO.

Q 13 What methods do you use to monitor consultant progress between major milestones?

A 13 ADOT uses a project management / development process that monitors significant milestones for both in-house and consultant designed projects. Consultants report monthly (soon to be bi0-weekly) on remaining duration of all activities ongoing between major milestones.

Q 14: How do you determine in-house costs when making comparisons to consultant costs for doing the same work?

A 14 Comparisons are performed between estimated and/or actual direct labor costs. Since in-house staff resources are not sufficient to perform but only a minor amount of the design work, we do not compare the total costs including direct and indirect overheads.

Q 15 Are training costs included in your cost comparisons of consultants vs. in-house resources? (Yes/No)

A 15 No, any comparisons are based on project direct labor costs.

Q 16 Does your Department have training programs for in-house staff who provide oversight/management of consultants? (Yes/No) If yes, please describe.

A 16 ADOT conducts on-going project management training, and routine general meetings for key staff in the Development organizations. The key to success is communication, and ADOT ensures communication through its training functions and through special partnering sessions between the various Sections and Services throughout the Development organization as well as the Engineering Districts. We are preparing an updated

Colorado
Interview Summary (did not interview)

Compilation of Interview Notes (did not interview) - Colorado

State Responses to Questionnaire - Colorado

Q - Question ***A - Answer***

Q1: What percentage of your annual budgets was expended for consultants for FY97, FY 98, and FY 99 for preconstruction engineering services *(road design, bridge design, right-of-way engineering, right-of way acquisition, right-of-way appraisals, bridge inspection, traffic engineering, geotechnical surveys, materials investigations, wetlands studies, archaeological/biological, landscape design, environmental, corridor studies, photogrammetry, feasibility studies, field surveys)?*

A1:

FY *	(1) Annual Program $	(2) Annual Constr. Program $ **	Precon Engineering Consultant $	PE % of (1)	PE % of (2)	Construction Engineering Consultant $	CE % of (1)	CE % of (2)
97	637,504,280	442,779,518	28,477,513	4.5%	6.4%	2,309,400	0.4%	0.5%
98	800,807,720	601,514,348	31,165,592	3.9%	5.2%	21,077,744	2.6%	3%
99	949,544,327	740,473,099	49,537,898	5.2%	6.7%	10,696,661	1.1%	1.4%

* Based on State Fiscal Year (July 1 through June 30) ** Includes some maintenance activities - available data does not discern between contractor and State performed maintenance.

Q2: What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for construction engineering services *(management inspections, materials testing)*?

A2 *See response to Question 1.*

Q3: Why does your Department use consultants?

A3 Colorado DOT uses consultants to supplement the agency's staff. The first and most crucial test is whether we have the in-house expertise. If that answer is yes, we ask "are they available? The Consulting community has always been important to the Department. They help get needed legislation passed, are able to gear up quickly when we have a fast track project, and they provide specialized technical knowledge that the Department may be lacking. Colorado DOT has a maximum number of state employees available to it, imposed by state statute. The consultant community has long been used to enhance or supplement the agency staff for peak work periods or for unusual expertise not available through the agency's own staff. With the dramatic increase in available funding and commensurate work in the past few years, the consultant supplement has become a much larger part our production force. These are a few reasons why the Department has and will probably always use consultants.

Q4: What was your Construction Program level in dollars for FY 97, FY 98, and FY 99?

A4: *See response to Question 1.*

Q5: If your annual construction budget increases, would you hire more consultants, more in-house staff or both? Why?

A5 Because we have the statutory employee cap that can not be exceeded; we would have to hire more consultants, become more efficient, or request that the statutory limit be modified. Given the current situation, we believe that the most likely course of action would be to hire more consultants while trimming excess, low priority functions from the duties of agency staff as well as seeking to improve efficiency through other means (e.g. new technology).

Q6: Is maintaining in-house technical expertise important? If so, what methods do you use to ensure adequate levels of expertise?

A6: *YES – it is critical; Maintaining in-house technical expertise is extremely important, however, CDOT hasn't been able to clearly define in just which areas it is most important.*

The methods Colorado DOT employs to ensure this are:

a) Increasing difficulty of assignments
b) In-house & Outside Training
c) Attending seminars & conferences
d) Encouraging communication with retired & outside subject matter experts.
e) Maintaining a "subject matter expert" in each disciplinary field within the central DOT staff.
f) Keeping a percentage of projects in-house. Includes many types of projects.

Consultants aren't awarded every complex project.
g) Mentoring
h) Succession planning.
i) Workload balancing – assuring that all of we're not giving all of a particular type of work to consultants.

Q7: What types of consultant contracts do you use and what approximate percentage are they of the total number of consultant contracts annually for FY97, FY98, and FY 99?

A7: For Right of Way:
Most use for ROW is Fixed-Price Non-Project Specific. Average is approximately 70% of all ROW contracts for each of the fiscal years 97, 98 & 99.

For Environmental Services:
Colorado DOT uses Environmental Specialty Contracts with the main focus of getting project NEPA Clearances.. Non Project Specific Contracts for Cultural and Natural Resources. The specific proportions of use is included in the details below.

For Engineering:
CDOT uses cost plus fixed fee (CPFF) contracts, specific rate of pay (SRP) contracts and lump sum (LS) contracts.

For FY 97 the distribution of those contracts was:

CPFF	12.2%
SRP	83.7%
LS	4.1%

For FY 98 the distribution of those contracts was:

CPFF	7.4%
SRP	89.7%
LS	2.9%

For FY 99 the distribution of those contracts was:

CPFF	8.0%
SRP	92.0%
LS	0%

Q8: Does your Department have an errors and omission policy (yes/no)? Please explain why.

A8: The Colorado DOT requires its engineering consultants to carry general and professional liability coverage and to name the State as an additional insured. It also requires that consultants, pursuant to the terms of their contracts with CDOT, indemnify and hold harmless the State, its employees and agents from all claims, damages, liability and court costs, expenses and attorney's fees, to the extent that such claims are caused by any negligent act or omission of the consultant, its employees, agents subcontractors or assignees. CDOT, itself, is self- insured and also relies on the protection afforded by the Colorado Governmental Immunity Act.

Q9: Please describe your experience, if any, with reimbursement from consultants who have committed errors or omissions.

A9: The Colorado DOT's Office of Risk Management reports no experience in seeking reimbursement from consultants who have committed errors and omissions.

Q10: How do you use in-house staff to procure consultants?

A10: For Right of Way:
For ROW, Colorado DOT uses region staff as project managers and central staff to contract, write scopes of work and monitor the approved task order.

For Engineering and Environmental Services:
Selection Boards are assembled using in-house staff that consists of region (project delivery staff and a central subject matter expert when bridge, environmental or geotechnical). Usually 3 to 5 staff individuals with expertise in the discipline needed for the project make up the board. The region project manager is responsible for assembling the board. The Central Agreements Office is responsible for handling all the administrative details and coordinating the process through the Attorney General Office and the State Controller. For design, the Central Agreements Staff maintains the template scopes and contracts. The Region staff modifies the scope to be project specific and to some extent, the selection criteria. For environmental services, the central environmental staff works with the Region environmental staff to draft the scope of services specific to the project (central staff maintains the template scope). Then Central agreements processes the Request for Proposal and the contract award. Then the Central Environmental Staff Manages the work.

Q11: How do you use in-house staff to manage consultant contracts?

A11: For Environmental Services:
Central Environmental Staff Manages some small, specific contracts. Region Staff manage the remainder (e.g. MIS, EA, EIS, etc)
For Right of Way and Engineering: The Region staff manage the day to day contract requirements.

Q12: (a) Does your Department retain any portion of payments until consultant contracts are successfully completed (yes/no)?
(a) If yes, what percent is withheld and over what stages of completion does this apply?
(c) Is any interest paid on the retained amounts to the consultants?

A12 (a) – Yes – NOTE: Colorado DOT is currently considering dropping retainage requirements in order to comply with the new FHWA regulation requiring return of retainage to subconsultants (subcontractors).
(b) - of the total contract amount is withheld. This total is obtained by withholding 10% from each monthly payment until the 5% withholding goal is reached.
(c) - No

Q13: What methods do you use to monitor consultant progress between major milestones?
A13 For Environmental Services:

Environmental Services Contracts are Task Order Contracts which allow us to control the volume of work into smaller tasks making the milestones more manageable. In the task order we set deadlines for milestones and do not pay the invoices until the milestones are met.

For Engineering and ROW: Consultants are in day to day contact with the project managers. A large percentage of our contracts are of the Task Order variety. These contract types have a limited scope within the more comprehensive scope of the Basic contract and a finite time line relative to the Basic. Using this tool it is possible to manage the consultant progress in incremental steps. Whether under a task order or a general performance contract, the consultant is required to report progress to the project manager or a specific periodic basis (generally monthly). The consultant staff and agency project manager meet regularly to discuss progress, problems and changes. Most projects (generally design) require scheduled meetings (milestones in plan development) where progress is further measured by a larger group.

Q14: How do you determine in-house costs when making comparisons to consultant costs for doing the same work?
A14: For Right of Way:
Colorado DOT uses a cost analysis worksheet available to compare costs.

For Engineering and Environmental Services:Consultant hourly rates are typically higher than CDOT hourly salaries rates for similar services, but the decision to use consultant services is made by regional personnel on a manpower availability basis not a cost comparison basis.

Q15: Are training costs included in your cost comparisons of consultants vs. in-house resources (yes/no)?
A15: No

Q16: Does your Department have training programs for in-house staff who provide oversight/management of consultants (yes/no)? If yes, please describe.
A16 For Right of Way:
Yes – Very informal/mentoring
For Engineering and Environmental Services:

Currently, the Central Agreements Office offers training to regional people in contract management. All the administrative aspects of contract oversight and management are covered. This training program will be expanded in this coming year to include training for selection board members.

Connecticut
Interview Summary

On 5/17/00 the FLH Bench Marking Study Team consisting of representatives Ed Calderon, Rick West, and Dan Alexander met in Hartford, Connecticut to meet with representatives of the Connecticut Department of Transportation.

ATTENDEES:

• Arthur W. Gruhn	Construction Administrator	860-584-2680
• Steve Barton	Manager of Consultant Design	860-594-3189
• L. Brian Castler	Manager of Construction	860-594-2660
• Wally Lugli	Fiscal Admin. Supervisor	860-594-2966
• Tom Harley	Consultant Design	860-594-3191
• Lee Schwegler	Construction Eng, FHWA	860-659-6703

We met for a three hours period, reviewing the purpose of the meeting, making introductions, briefly explaining how Federal Lands operates and then how the Connecticut Department of Transportation delivers their design and construction program – touching on both in-house and out sourcing issues.

REFERENCE MATERIALS:

- Organization Chart - Office of Engineering & Highway Operations
- Organization Chart - Office of Engineering - Consultant Design Division
- Organization Chart - Consultant Design Section State Roads
- Operational Guidelines for Selection fo Consultations by the Conn DOT
- State of Conn. DOT, Bureau fo Eng and Hwy Ops - Pamphlet for Monitoring Performance and payment Requests for Consults.
- Construction Engineering and Inspection - Information Pamphlet for Consultants
- Boiler Plate - Agreement
- Consulting Engineers Manual

OVERALL FACTS

- Connecticut views their core competencies as maintenance, engineering, contract administration, construction inspection, and, to a lesser extent, survey, which in-part is mandated by legislature.
- The size of the Department's workforce is determined by the Legislature.
- Department outsourcing has historically been about 80% for design projects.
- For large projects over $5million, the decision to contract out is based on workload and availability of department staff.
- A single unit consisting of 50 employees manages highway and structure design

contracts.

- Environmental Compliance (contaminated and hazardous materials) contracts out a majority of their work.
- Other offices manage a lesser number of design consultants involved in other areas, such as architecture and bridge inspection.
- The Office of Construction manages construction inspection consultants.
- There is no specific procedure for distributing workload among the Project Managers.
- A 2.5% retainage is held for every phase and released at the end of the respective phases.
- Recently, contracted construction engineering has jumped from 50% to a current level of 80-85%.

CHALLENGES

- The Department has lost a great deal of design expertise by moving from in-house designs to outsourced designs.

HIGHLIGHTED PRACTICES

- Consultant preparation of scope at no cost to the Department
- A&E section prepares all independent estimates for contracted work
- Consultant management firms may manage a group of smaller projects with the authorization to hire other consultants
- Use industry input to focus on special design issues
- Maintain a successful rate of collecting from consultants for liability issues
- The Department employs a consultant claim's specialist
- If the AE's proposal is +/- 50% of the IGE, it is assumed that there is a scope problem and the scope is re-written. Otherwise, they go directly to price negotiation.
- For project scheduling, they post end (milestone) dates only. Automated milestone date reports are printed monthly.
- The majority out-sourced projects are managed "cradle to grave by the consultants." These design firms remain in service through the construction phase.

Compilation of Interview Notes - Connecticut

Legislature determines the size of the workforce.

If a project is over $5 million they are forwarded for possible out sourcing.

Big jobs go to AE and small jobs stay in house.

Most projects that are out-sourced are cradle to grave. The design firm would also stay on for the post construction work. Lots of advantages for the consultant to do all the work.

Surveys; GIS and Property, are done in-house under the office of construction - mandated by

legislature.

State Core Competencies; Maintenance, Contract Administration, Engineering, Survey(to a minor extent) & Construction Inspection.

Contract out 80% design.

Single unit to manage AE work is comprised of 50 employees.

State Design staff is comprised of 120 employees.

Technical services branch is comprised of 100 employees

Environmental Compliance is comprised of 15 employees.

Traffic is comprised of 80 employees.

The State is divided into 4 districts.

AE's prepare the scope of work at their own expense - these costs are contained in their Overhead.

ConnDOT prepares independent estimates for contracted work. The office overseeing the assignment (i.e.: engineering, bridge safety, construction, etc) prepares the independent estimate. The Department employs a consultant claims specialist for assisting in the analysis of construction contract claims.

If the AE's proposal is +/- 50% of the IGE, it is assumed that there is a scope problem and the scope is re-written. Otherwise, they go directly to price negotiation.

Most of the Design contracts are lump sum.

Construction Inspection is cost plus fixed fee.

State pays a maximum burdened rate of 150% to A/E's -- averaging 127% OH and 23% profit.
[Hourly rate+1.27hourly rate X1.10=2.5(hourly rate)

State pays a maximum burdened rate of 165% for environmental Contracts

Project Engineers oversee 6-8 projects

Project Managers oversee an average of 20 design projects.

AE's are allowed to proceed prior to signing the contract agreement..

2.5% Retainage is held for every phase - Retainage is released after each phase. Phases include; Preliminary Design, Final Design, and Construction

AE fees are about 5-6% of the Construction Cost.

They average cost for PE is 12%. When they include the state add-ons, PE goes up to 15% on average. PE ranges from 6-50%.

They are allowed to hire a consultant management firm to handle other smaller projects. The consultant is authorized to hire consultants. The office overseeing the consultant activity prepares the independent government estimates.

In-house design and environment have available, on-call contracts

The office overseeing design consultants is called the consultant design office.

Their consulting offices don't maintain some technical skills like CADD. They don't review in-depth. They conduct very cursory reviews.

5-10 projects per year receive a constructability review where the consultant participates. The state focuses on special design issues with industry participation.

Construction contractors are saying that In-house designs are better than consultant designs.

No real aversion to "going from doing to managing". The state has been doing this since the 1950s.

They have lost a great deal of expertise by moving from In-house to out-sourced design.

Most of environment is contracted out.

84% of the construction program is designed by consultant.

2/3 of the construction dollar value of contracts is inspected by consultants. The other 1/3 is inspected by in-house for projects primarily under $5 million.

In the mid 60's, CNDOT had only "some" experience with contracting Construction Inspection only. This was done only on major projects. In the mid 80's, they were contracting out 50% of their construction engineering. However, lately these figures have jumped to 80-85%

They VE all their PS&E for contract values > $25 Million. VE savings in construction are shared between the agency and the contractor.

They don't have any measurements related to cost of doing work with consultants as compared

with their own in-house costs.

They are very successful collecting money under their Liability clause from consultants. This is due in part to the vast amount contracting out.

AE's designers are kept on board through construction completion. They assist on Construction changes.

They have a consultant claim's specialist on board. The claims consultant is used to augment department staff for construction contract claims.

They have a contingency amount of 10% in their construction contracts.

Scheduling: They post end dates only.

They use milestone dates only.
Priorities are scheduled by project.

They produce shelf- projects - to enable them to spend all of their obligation.

Automated milestone date reports are printed monthly.

Selection: Interview top five firms - CNDOT group recommends ranking but the commissioner selects.

Once a year the department conducts a prequalification process for interested consultants. Actual selections are project specific and the review and interview process is conducted periodically throughout the year.

The Office of Engineering manages all design projects. Other outsourced projects are managed by the respective office (i.e.:construction , bridge safety, etc.)

Workload is not distributed to Project managers based on Dollar size of project only. Complexity and how much that particular project manager can handle are primary factors in workload distribution.

State Responses to Questionnaire - Connecticut

Q - Question ***A - Answer***

Q 1: What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for preconstruction engineering services (road design, bridge design, right-of-way engineering, right-of-way acquisition, right-of-way appraisals, bridge inspection, traffic engineering, geotechnical surveys, materials investigations, wetlands studies, archaeological /biological, landscape design, environmental, corridor studies, photogrammetry, feasibility studies, field surveys, hydraulics and research)?

A 1 For FY98 the percentage of our preconstruction engineering services budget expended on Consultant related activities was approximately 80%. For FY99 it was approximately 78%. Data is not available for FY97 but it is assumed to be similar to FY98 and FY99.

Q 2: What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for construction engineering services (management, inspections, materials testing)?

A 2: For FY98 the percentage of our construction engineering services budget expended on Consultant related activities was approximately 50%. For FY99 it was approximately 49%. Data is not available for FY97 but it is assumed to be similar to FY98 and FY99. No data is available to break out construction engineering services by function.

Q 3 Why does your department use consultants?

A 3 Consultants are used to augment the in-house design staff. We have a core of in-house designers to handle urgent assignments and some other projects. The size of the in-house design staff remains the same. The overflow of work is assigned to consultants. Generally, our larger projects go to consultants. Consultants are also needed for highly specialized designs, such as moveable bridges.

Q 4: What was your Construction Program level in dollars for FY 97, FY 98, and FY 99?

A 4 The contractor expenditures for FY98 were $305 million. For FY99 expenditures were $312 million. No data is available for FY97.

Q 5: If your annual construction budget increases, would you hire more consultants, more in-house staff, or both? Why?

A 5 Probably more consultants, because approval of other Government entities is required to increase our in-house staffing. In the past, there have been occasional staff increases.

Q 6 Is maintaining in-house technical expertise important?

A 6 Yes. One-the-job training and occasionally classroom training.

Q 7 What types of consultant contracts do you use and what approximate percentage are they of the total number of consultant contracts annually for FY 97, FY 98, and FY 99? .

A 7 We use 2 basic types of contracts: Lump sum and Cost Plus. Preconstruction Consultant contracts are approximately 95% Lump sum. Construction Inspection Contracts are 100% Cost Plus.

Q 8 Does your Department have an errors and omission policy? (Yes/No) Please explain why.

A 8 We have guidelines government errors and omissions in order to allow the Department to be compensated for unnecessary costs incurred during construction.

Q 9 Please describe your experience, if any, with reimbursement from consultants who have committed errors or omissions.

A 9 Mixed. Some consultants reimburse the Department promptly for the costs resulting from errors and omissions. Others contest the issue over a long period of time(year), generally on larger claims.

Q 10 How do you use in-house staff to procure consultants?

A 10 We have a consultant selection process, which includes several panels made up of three permanent members each and one member representing the office that will manage the project. The permanent panel members are full-time Department employees who serve limited terms on the selection panel on a part-time basis.

Q 11: How do you use in-house staff to manage consultant contracts?

A 11 The Division of Consultant Design is a unit in the Office of Engineering whose sole responsibility is to manage consultant contracts. Individual Project Engineers are each assigned a number of projects to serve as liaison between the Consultant and the Department. These projects involve highway and structure design. Other offices in the Department manage a lesser number of design consultants involved in other areas such as architecture, bridge inspection and environmental analysis. The Office of Construction manages construction inspection consultants.

Q 12: Does your Department retain any portion of payments until consultant contracts are successfully completed? (Yes/No)

A 12 Yes

Q 12a If yes, what percent is withheld and over what stages of completion does this apply?

A 12a 2.5% retainage - held until completion of the next phase. A partial release of retainage after completion of the phase is considered upon request – granted if the project is running smoothly.

Q 12b Is any interest paid on the retained amounts to the consultants?

A 12b no

Q 13 What methods do you use to monitor consultant progress between major milestones?

A 13 Liaison visits, progress prints, telephone conversations. On active projects, there is usually a continuous dialogue between the Department's Project Engineer and the

Consultant's Project Engineer.

Q 14: How do you determine in-house costs when making comparisons to consultant costs for doing the same work?

A 14 We don't

Q 15 Are training costs included in your cost comparisons of consultants vs. in-house resources? (Yes/No)

A 15 DNA

Q 16 Does your Department have training programs for in-house staff who provide oversight/management of consultants? (Yes/No) If yes, please describe.

A 16 No

Florida
Interview Summary

On 5/15/00, the FLH Bench Marking Study Team, consisting of representatives Calderon, West, and Alexander, met in Lake City, Florida to meet with representatives of District 2 of the Florida Department of Transportation.

ATTENDEES:

- Mike Stalvey — District Professional Services Administrator
- Kathryn Thomas — District Consultant Project Management Engineer
- Al Moyle — District Consultant CEI Engineer.

We met for a three hour period; reviewing the purpose of the meeting, making introductions, briefly explaining how Federal Lands operates, and then how the Florida Department of Transportation delivers their design and construction program, touching on both in-house and out sourcing issues.

REFERENCE MATERIALS

- Statewide Construction Work Load
- F.D.O.T. District II Construction
- District Two Consultant CEI Work Program

OVERALL FACTS

- Size of Program: From 1997 to 1999, between 2.7 to 3.4 billion Statewide. Most of the District 2 has same program as other districts, 3R, bridge, Replacement and new alignment.

- Size of workforce is fixed by legislation, but program continues on an upward trend.
- Contracting Out Levels: 70% of all PE is outsourced. 100% of Construction work is outsourced.

CHALLENGES

- Maintaining technical expertise – District does not have the flexibility to hire the skills needed to do their work. They have to train the employees and fit the workload as needed.
- Competition for Staff – Increased outsourcing has resulted in consultants competing with each other and the State for experienced staff, thus driving up the salary for experienced personnel and leaving the state with the least experienced personnel in some areas.

HIGHLIGHTED PRACTICES

- Perform in-house surveys only once at the beginning of the project. Then they had the construction contractors verify the survey at the end.
- Use of Design consultant to perform post construction design services.
- The Consultant Evaluation Process is well in place and is used to access further work.
- Higher promotion potential for project managers who handle out-sourced work
- Quality 2000 initiative – Training program that requires consultant inspectors to become certified as are the in-house staff. The intention is to become the trainer of choice. This will boost cost of Consultant contracts.
- Two Different Item Contingencies – 5 % pay item for contingencies; another 5% for general.
- Shifting to lump sum and away from individual pay items in order to save on resource loads and on measurement for each pay item.
- Train personnel around existing workload.
- In-house design gets the first choice of projects and receives a variety of work.
- They emphasize training and work with consultants to develop it.
- Construction Management is contracted out by the project and not piecemeal.
- Contract out large projects for cost-effectiveness. They bundle some smaller projects to make contracting out more cost effective.
- They contract out the CE [for projects located throughout the district].

Compilation of Interview Notes - Florida

Florida Department of Transportation, District 2 Contracting Out Interview, May 15, 2000, Lake City, Florida.

They cannot add new positions - must go through legislation for any increase in FTE.

On Project Development, they contract out 70% of the work.

They think they have a range of skills in the state.

Their organization is very dynamic - They train their people around the workload they have.

They recognize that they must keep in-house staff up to the challenge. Lots of training - DOT working with Consultants to develop training .

In-house staff gets first choice on incoming design work.

They can't give the in-house staff only the small projects but have to give them some variety to keep them interested.

Most of their current program is RRR(traffic operations, safety, bridge repair). Keeping the in-house staff challenged is very important.

They are only doing original surveys in-house once, and at the beginning of the project.. Then they have the construction contractors verify the survey at the end

They use two different item contingencies in their construction contracts-
5% pay for item contingencies; another 5% for general.

They keep the design consultant to do the post construction design services and set up limited funds for each project to do this.

In cases of errors and omissions in plans, the state normally doesn't go after the design consultant if the government would have paid for the services anyway.

Consultants are held accountable for the quality of their designs and other issues such as being timely, easy to work with, and being very subjective. The FDOT Consultant project managers are
responsible for documenting the performance of each design consultant. The results of their evaluations are used in future selections.

Construction Management is contracted out as a complete effort (whole staff). No piece meal services are used. FDOT has oversight responsibility.

FDOT has found that it is more cost effective to contract out on large projects. Therefore they bundle some smaller efforts/projects to make contracting out more cost effective. They like to contract out projects that are in remote areas or where they don't have adequate staff to cover.

Consultant Construction Inspectors are offered the same training courses as FDOT personnel but working with the University of Florida to be the trainer of choice. FDOT does have a new

initiative, "QC 2000", which requires the consultant inspectors to become certified just like in-house staff. They believe that this will boost the cost of the Consultant contracts.

Trying to shift to a lump sum and away from individual pay items to save on resource loads on measurement for each pay item.

FDOT is shifting a greater responsibility for ensuring quality control to the contractor, however, the in-house staff is still performing some quality control testing.

No formal training for construction contract administration is provided to Construction Project Managers to oversee and manage consultant contracts.

The central office is responsible for the Bridge Program. Districts don't have all of the required skills intentionally, so that the bridge skills can be maintained in the central office, however, the District handles type I structures.

The Construction Project Manager rates the contract design package for it's constructability. These evaluations are also used in the A&E selection process. They are planning to utilize this evaluation process to reward outstanding performing firms to receive work without further competition.

Consultant Construction Engineering/Inspection Costs are rising.

FDOT to assume more of the contract compliance function.

FDOT is planning to increase their use of A&B Bidding to reduce contract time and thus contract oversight resource time. .

By legislation, A&E contracts are left open for 3 years with 2 one year options available for use.

FDOT employs 16 design project managers to handle the "out-sourced" work. "One person show" - no direct line support staff.

Three PM for in-house work. They sign and seal the plans. One or two reconstructions, some RRR, some traffic.

Preliminary Design and Environment is already done primarily by in-house staff before the work is distributed to consultants.

All design project managers have an average10 years of experience.

Ten % PE and 15% of CE are their goals. The Department tries to negotiate 10% or less of construction estimate for PE and 15% or less of construction estimate for CEI services.

State Responses to Questionnaire - Florida

Q - Question ***A - Answer***

Q 1: What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for preconstruction engineering services (road design, bridge design, right-of-way engineering, right-of-way acquisition, right-of-way appraisals, bridge inspection, traffic engineering, geotechnical surveys, materials investigations, wetlands studies, archaeological /biological, landscape design, environmental, corridor studies, photogrammetry, feasibility studies, field surveys, hydraulics and research)? :

A 1: 70%

Q 2: What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for construction engineering services (management, inspections, materials testing)?

A 2: 70%

Q 3 Why does your department use consultants?

A 3 Not enough state employees to handle work load.

Q 4: What was your Construction Program level in dollars for FY 97, FY 98, and FY 99?

A 4 1.2 b(fy 97), 1.4 b(fy 98), 1.4 b(fy 99)

Q 5: If your annual construction budget increases, would you hire more consultants, more in-house staff, or both? Why?

A 5 More consultants. Legislature is looking to reduce the number of state employees.

Q 6 Is maintaining in-house technical expertise important?

A 6 Yes.

Q 7 What types of consultant contracts do you use and what approximate percentage are they of the total number of consultant contracts annually for FY 97, FY 98, and FY 99? .

A 7 We use consultants for everything. 70% of all work See tables FL-01, FL-02, and FL-03

Q 8 Does your Department have an errors and omission policy? (Yes/No) Please explain why.

A 8 Yes. To hold consultants accountable for quality of their work. See Procedure.

Q 9 Please describe your experience, if any, with reimbursement from consultants who have committed errors or omissions.

A 9 Minimal to date. Districts doing more and more of it.

Q 10 How do you use in-house staff to procure consultants?

A 10 See procedures. Long list, short list, negotiations on price.

Q 11: How do you use in-house staff to manage consultant contracts?
A 11 Project managers for oversight and guidance as needed.

Q 12: Does your Department retain any portion of payments until consultant contracts are successfully completed? (Yes/No)
A 12 No.

Q 13 What methods do you use to monitor consultant progress between major milestones?
A 13 Day to day interactions. Quarterly evaluations given by P. M. to consultant

Q 14: How do you determine in-house costs when making comparisons to consultant costs for doing the same work?
A 14 Working to develop a job cost accounting system to better track this. Difficult to capture DOT overhead associated with vehicles and buildings.

Q 15 Are training costs included in your cost comparisons of consultants vs. in-house resources? (Yes/No)
A 15 Yes, included in overhead for both.

Q 16 Does your Department have training programs for in-house staff who provide oversight/management of consultants? (Yes/No) If yes, please describe.
A 16 No. But we do have procedural guidelines and office operations manuals for our processes.

Illinois

Interview Summary (did not interview)

Compilation of Interview Notes (did not interview) - Illinois

State Responses to Questionnaire - Illinois

Q - Question ***A - Answer***

Q1: What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for preconstruction engineering services *(road design, bridge design, right-of-way engineering, right-of-way acquisition, right-of-way appraisals, bridge inspection, traffic engineering, geotechnical surveys, materials investigations, wetlands studies, archaeological/biological, landscape design, environmental, corridor studies, photogrammetry, feasibility studies, field surveys)*?

A1 Please refer to attached spreadsheet

Q2: What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for construction engineering services (*management, inspections, materials testing)*?

A2 Please refer to attached spreadsheet

Q3: Why does your Department use consultants?

A3 To supplement our staff and/or specialized expertise.

Q4: What was your Construction Program level in dollars for FY 97, FY 98, and FY 99?

A4 Please refer to attached spreadsheet.

Q5: If your annual construction budget increases, would you hire more consultants, more in house staff, or both? Why?

A5 Yes. In the spring of 1999 the legislature passed Governor Ryan's Illinois FIRST program which is a revenue package increasing the Department of Transportation's 5 year highway improvement program by 55 percent and resulting in a $10.5 billion highway improvement program. To accomplish this ambitious program with a down-sized staff, the Department has committed to hire more technical and engineering staff and has increase our consultant program from $55 million in FY 99 to $160 million in FY 00 and $200 million in FY 01.

Q6: Is maintaining in-house technical expertise important? If so, what methods do you use to ensure adequate levels of expertise?

A6 Maintaining in-house expertise is very important to the Department of Transportation in Illinois. We have program development training addressing preliminary engineering issues, and specific task training geared to construction personnel. In-house staff considered experts in their field teach each of these programs.

Q7: What types of consultant contracts do you use and what approximate percentage are they of the total number of consultant contracts annually for FY 97, FY 98, and FY 99?

A7 We select consultants to perform almost every aspect of our process from Phase I (planning) studies, environmental studies, surveying, all types of plans, electrical projects, structure design, Phase II (designing and plan preparation), Phase III (construction inspection), and have recently added Quality Assurance and bituminous and concrete mixtures control. We do not have these broken down by the number of each. Most of the work we select consultants for fall into the Phase I and Phase II categories. Consultants selected to do construction inspection have been increasing over the last couple of years.

Q8: Does your Department have an errors and omission policy (yes/no)? Please explain why.

A8 We currently have a process to "back charge" consultants for errors discovered during construction and provisions to allow for charging for phase I errors discovered while performing phase II work. To date, we have only "back charged" for errors discovered during construction. With the implementation of our new Standard Agreement

Provisions for Consultant Services due to be effective this year, a new policy on errors and omissions will take effect. This includes a standard of care for which the consultant will not be back charged when the dollar amount for the damages as a result of their error is under ½ of one percent of the construction contract amount or $5,000 whichever is less.

Q9: Please describe your experience, if any, with reimbursement from consultants who have committed errors or omissions.

A9: If the consultant was given an opportunity for input into the corrective measures, we have been successful in obtaining reimbursement. If the consultant was not give an opportunity to take correct measures (i.e. redesign) we have not been as successful. Our current policy stipulates the consultant must be given an opportunity for correction, if time allows for it. In some instances, the Department has taken corrective measures so as not to delay the contractor. Our new policy will allow us to back charge the consultant whether they were involved in the correction or not.

Q10: How do you use in-house staff to procure consultants?

A10 See attached Illinois Departmental Order 6-2.

Q11: How do you use in-house staff to manage consultant contracts?

A11: We have nine different districts managing the consultants work in their area. Hence at least nine different methods of managing consultants.

QA12: (a) Does your Department retain any portion of payments until consultant contracts are successfully completed (yes/no)? Yes

(b) If yes, what percent is withheld and over what stages of completion does this apply? 3-5%

(c) Is any interest paid on the retained amounts to the consultants? NO

Q13: What methods do you use to monitor consultant progress between major milestones?

A13: There are regularly scheduled meeting with the consultant during the course of project development. Additionally, consultant invoicing is monitored by the district to ensure dollars expended (percentage) somewhat parallel the amount of work completed (percentage). If there is a disproportionate amount being invoiced versus the amount of work actually completed, an immediate meeting is held between the district and the consultant to resolve the situation.

Q14: How do you determine in-house costs when making comparisons to consultant costs for doing the same work?

A14: We do not compare in-house and consultant costs.

Q15: Are training costs included in your cost comparisons of consultants vs. in-house resources (yes/no)?

A15: N/A

Q16: Does your Department have training programs for in-house staff who provide oversight/management of consultants (yes/no)? If yes, please describe.

A16: One of our Program Development classes is on Consultant services.

Illinois Department of Transportation Annual Program Items FY 1997, 1998, and 1999

	FY 97	% of program	FY 98	% of program	FY 99	% of program
Annual program(*)	$1,200,000,000		$1,085,000,000		$1,145,000,000	
State Preliminary Eng. Program Obligated	$51,416,126	4.28%	$51,728,572	4.77%	$59,256,990	5.18%
State Construction Eng. Program	$15,809,120	1.32%	$7,950,271	0.73%	$17,404,674	1.52%
Construction program	$1,145,000,000		$1,030,000,000		$1,090,000,000	

Indiana
Interview Summary

On 6/1/00 the FLH Bench Marking Study Team consisting of representatives Dan Alexander, Terri Jurkofsky, Rick West & Ed Calderon met in Indianapolis, Indiana to meet with representatives of the local Department of Transportation.

ATTENDEES

• Rick Drumm	Program Operations Engineer, FHWA	317-226-7487
• Firooz Zandi	Acting Chief Engineer	317-232-5522
• Jeff Clanton	Consultant Services Mgr, Design	317-232-4198
• Alan Curson	Land Acquisition	317-232-9146
• Tim Bertram	Chief, Contract and Constructions	317-232-5502

We met for a three hours period, reviewing the purpose of the meeting, making introductions, briefly explaining how Federal Lands operates and then how the local Department of Transportation delivers their design and construction program – touching on both in-house and out sourcing issues.

REFERENCE MATERIALS

- Organization Chart - Indiana Department of Transportation
- Consultant Services Procedures - November 1999
- Indiana Department of Transportation, Consulting Services Procedures

OVERALL FACTS

- Size of Program: Doubled from 1996 to 1997 from 350 million to 700 million. Has been at this level ever since.
- PE budget is 95 million
- Contracting Out Levels: 90% of all Design and Surveys; 70-80% for Planning and Environmental. CE outsourced is minimal.
- Out of 500+ consultant contracts per year, they have had problems with only 20 of them.
- Each District has a Division that designs primarily small structures, maintenance contracts, and overlays.
- Construction staff of 4500 employees handles 700 million dollars of construction work.
- In-house design, for most part, is centralized in Indianapolis office.
- Core competencies are in the areas of design, construction, and maintenance. Consultants need to live and pay taxes in the state to received INDOT work.
- Consultant budget is 75 million contracted-out.
- INDOT used to have an A&E team but that lead to 33% overtime for consultant oversight.

CHALLENGES

- Maintaining Technical Expertise – Severe problems in filling positions and in retaining engineers. INDOT is short 75 engineering positions and about a dozen of these they have not been able to fill in over a year due to a lack of candidates. They have future plans to adopt Kentucky DOT's Scholarship Program. In the meantime, they have had to change overtime policies to be able to handle the work with the resources they have.
- Quality of consultant construction management and inspection is low and cost is high compared to in-house efforts. As a result, they do not outsource very much CE.
- INDOT faces resistance to outsourcing from District offices .

HIGHLIGHTED PRACTICES

- INDOT's found that consultants cost twice as much to do work.
- Performance-Based Contracting – in the beginning stages of developing criteria.
- Checklist Review Process for reviewing consultant designs.
- Training provided to consultants at no cost.
- Consultant contracts left open to allow for construction support.
- Consultant has 48 hours to work out "bugs" that are identified during the bidding process.
- Errors and Omissions Policy
- Scheduling Process including Time and Milestones reports, monthly cross-functional team meetings, etc.
- Construction Contractor Certification Process
- INDOT tends to have employees work on bigger, more complicated projects to maintain technical expertise. They keep records of in-house projects to show they can compete with consultants.

- Work is outsourced in piecemeal fashion intentionally. INDOT thinks consultant involvement from cradle to grave gives the consultant too much flexibility.
- Put out about 3-4 design PSB's(similar to our CBD/RFP process) per year which average about 25-30 projects.
- Almost all construction work is done in-house. If construction engineering is consulted - it is all or none.
- They use formal, construction partnering.
- All engineers are Project Managers by default. Some non-engineers are Project Managers, too.
- INDOT uses three criteria to evaluate construction contractors: performance and whether they are on time and on budget.

Compilation of Interview Notes - Indiana

Indiana Department of Transportation Interview on May 31, 2000

INDOT provided an organization chart. Each District has a Division that designs primarily small structures, maintenance contracts, and overlays. The Department has 5,000 employees – 500 of these are engineers. Construction has the largest staff -- 4500 employees who handle 700 million dollars of construction work. They struggle to keep engineering positions filled. INDOT is short 75 engineering positions and about a dozen of these they have not been able to fill in over a year due to a lack of candidates. They are looking into adopting a program similar to KYDOT's scholarship program which targets 10-20 new engineer trainees per year. In the meantime, they have had to streamline internal procedures and change overtime policies to be able to handle the work with the resources they have.

In-house design, for most part, is centralized in Indianapolis office. The Department faces resistance to outsourcing from District offices, especially in Construction. They don't always use A+B bidding.

Core competencies are in the areas of design, construction, and maintenance. Consultants need to live and pay taxes in the state to receive INDOT work.

Strategy: To maintain technical expertise, INDOT monitors projects done in-house and tends to have INDOT employees work on bigger, more complicated projects. They keep records of in-house projects to show they can compete with consultants. A person from the Design Staff attends scoping reviews.

They have had headaches with Design Build contracts (INDOT has let 3 design/build contracts). Still in learning process with these.

Doubled from 1996 to 1997 from 350 million to 700 million – has been in this range since. Will drop back to 600 million in 2001. INDOT predicts, in the long range, program will double again.

PE – 90% for Design and Surveys: Planning and Environmental is 70 – 80 %. PE includes design, planning, geotechnical, surveying work.

CE – Minimal – Consultants are used only when specific area of expertise is needed. Geotechnical services use ~~has~~ a pre-qualified list of 5-6 firms. No pre-qualified list for design.

Consultant budget is 75 million.
PE budget is 95 million (37 million is design – rest is as follows: 5 million for ROW; 3-7 million for CE/contract administration, 25 million for scoping, bridge, and environmental services and 1.5 million for Geotechnical services.

PE--Work is outsourced in piecemeal fashion intentionally. Each functional Division makes the decision on which work they will outsource. INDOT stated that they don't want the consultant involved from cradle to grave because they believe this gives the consultant too much flexibility (can build a Cadillac when they only wanted a Ford). Use Professional Services Bulletin (PSB), similar to RFP, to solicit interest statement from consultants. There are no pre-qualified consultants (pre-qualification process only applies to construction contractors). Publish about 3-4 design PSB's(similar to our CBD/RFP process) per year which average about 25-30 projects. Design services are advertised for 2 weeks.

CE – INDOT uses consultant construction managers/project engineers and inspectors very infrequently. Almost all construction work is done in-house. If construction engineering is consulted - it is all or none.

CE consultants are not familiar with state procedures and the way states do their business, therefore INDOT doesn't use them as often as they might.

Design costs are only 5% of the construction value.

Design – lump sum (some open-ended (IDIQ) – e.g., surveys, structures)
Construction – cost plus fixed fee

Overhead – external – they have limits – up to 160% for state funded projects
No limit on Federally Funded Projects.

internal – 60-65% (includes all of staff) does not include rent - light,etc.126% is what is used for in-house Design.

They use formal, construction partnering. They have 3 meeting days -- 1 with consultants, 1 with contractors (construction), and one joint meeting ½ day.

Jeff in the Agreement's Section has 3 eng and 3 clerical that do limited reviews and oversight. Their program size is 37 million.

INDOT old program had 8000 employees with a 200 million program, now have 4500 with a 700 million program. 10% of their staff are engineers.

INDOT is organized functionally. Process for making decisions on outsourcing PE is decentralized. Each functional Division does its own workload analysis and makes its own decisions on in-house vs. contracted out work. Cycle: HQ requests project list from Districts -- Programming staff reviews -- Scoping Phase/EIS -- award.
CE – Districts make outsourcing decisions. Each year HQ reviews/projects annual staffing program by district, based on projected schedule for the next construction season (April to November). HQ monitors which districts need help, but finds districts resist getting help from consultants. Both in-house and contractor staff do not like consultants performing managing and inspection activities for reasons similar to those given by KYDOT staff. That is, consultant construction managers and inspectors are not as familiar with the state's procedures and, therefore, tend to take longer in processing actions, such as change orders, or to err on the conservative side.

Every District has a Construction Engineer and an Area Engineer.

20 year plan: average of 25-30 new projects per year
Projects per person – 100 – (50 new and 50 supplemental)
10 - 15 projects each for 4 Project Managers .

They are responsible for various stages of the projects from scoping through PS&Es.

All engineers are Project Managers by default. Some non-engineers are Project Managers too.

Only the Deputy Commissioner for Planning and Finance can approve a slip in schedule.

In the Design sections, consultant management is concentrated in one or two positions. There are 4 design sections consisting of 20 people each, including one project manager and structures people.

Project Managers also do design work.

Design - 20% turn over per year.

Entry-level pay - $30,000 as compared to $38,000 offered by private industry.

Between 1995 and 1998, INDOT tracked CE costs and found that consultants cost twice as much to do work as in-house personnel.

INDOT has future plans to echo Kentucky's Scholarship Program. They are considering paying up to $32,000 for college, giving EITs a 9% raise and Professionally licensed engineers a 23% raise.

INDOT targets certain projects to in-house staff to maintain expertise. INDOT keeps records of project assignments to show they can compete with consultants. INDOT is having trouble recruiting and retaining engineers. They are looking to implement KYDOT's scholarship program. In the meantime, they focus on employees handling the bigger, more complicated projects in order to maintain expertise in-house. INDOT believes the in-house expertise is critical.

CO-OPS stay 6 months in design and 3 months in construction. Recruited 2 from colleges last year.

Both computer and engineering expertise are the hardest to find. Consultants are raising their rates in these fields.

INDOT believes the quality of in-house work for design is a little better than consultants. For construction, they believe the quality of in-house work is much better in both cost and quality. Construction contractors have to be certified.

INDOT is working on developing performance-based contracting in construction. Goal is Level 3 performance in which you can measure when the job is done and know it meets it. Right now, process is too new to evaluate – are having some difficulties coming up with performance based specifications. They are using on time and on budget as measures.

INDOT uses a checklist for reviewing consultant designs rather than detailed review.

INDOT conducts consultant training every month for free.

Consultant design contracts are kept open (up to $10,000) to allow for construction support. Contracts are kept open until construction contract audit.

They hold retainage through PS&E approval. up to 10% for up to 90% completion. Once at 90% completion, consultant gets retainage. They also hold a 3% retainage on construction (monthly)

Once contract is in the award stage, consultant has 48 hours to work out "bugs" that are identified during the bidding process. If problems occur during construction, INDOT negotiates with consultant.

INDOT uses three criteria to evaluate construction contractors: performance and whether they are on time and on budget.

Out of 500 plus consultant contacts per year, INDOT had problems with only 20 of them.

Abolishment of separate consultant management section – INDOT had a section that managed consultant design only. The cost was 33% overtime for consultant oversight. Lesson learned was

that they could not find/keep people who have sufficient hands-on expertise. To maintain expertise, they decided to spread this function back to the design group - to have a combination of In-house and Out-sourced projects to manage.

Line item authority for construction change orders – District has up to $200,000 line item authority for change orders. Change orders over or $200;000 or 20% of contract must be approved at higher levels.

Scheduling:
Developed by consultant, Uses templates, Use coordinators, Time and Milestones reported, Monthly tracking meetings with Cross Functional teams and section managers, 12 month look ahead reports, Report advertising dates only, Activity meetings as required. Only one person is authorized to approve making changes.

State Responses to Questionnaire (did not receive) - Indiana (not available)

Q - Question ***A - Answer***

Kansas Interview Summary

On 5/30/00 the FLH Bench Marking Study Team consisting of representatives Dan Alexander, Terri Jurkofsky, Rick West & Ed Calderon met in Topeka, Kansas to meet with representatives of the State Department of Transportation.

ATTENDEES

•	David Comstock	Director of Engineering and Design	785-296-2270
•	Kurt C. Dunn	Engineering Services Team Leader	785-267-7286
•	Neil Rusch	KDOT	785-296-2270
•	Jim Kowach	KDOT	785-296-3531

We met for a three hours period, reviewing the purpose of the meeting, making introductions, briefly explaining how Federal Lands operates and then how the local Department of Transportation delivers their design and construction program – touching on both in-house and out sourcing issues.

REFERENCE MATERIALS

- Organization Chart - Kansas Department of Transportation
- Organization Chart - State Road Design Engineer.
- Consulting Engineer Qualification Questionnaire
- Consultant Selection Process
- Consultant Selection Time Table
- Flow Chart of the General Discovery Phase Activities
- Project Evaluation Form
- Listing of Professional Services for Consultant Qualifications
- KDOT 2000 Telephone Directory

OVERALL FACTS

- Philosophy is to fit people to current structure, but they are becoming more flexible in accommodating individual skills.
- Size of Program: Dropped from 600 + million in 1997 to 400+ million range in 1998 and 1999.
- Contracting Out Levels: 70-80% ($20-30 million per year) of all PE is outsourced. Percentage for CE not provided. All inspection for secondary road projects is outsourced.
- In-House Design ($12 million).
- Construction Dollars are in the $400-600 million range.
- Had separate A/E section at one time, but found people who come to KSDOT do not want to manage contracts. In-house squads do a mix of in-house and consultant management.
- 10 year plan – 6 to 7 billion for construction program.

CHALLENGES

- Maintaining Technical Expertise -- KSDOT is having difficulty retaining new engineers -- They are finding that young designers want to "do," not manage design work. They try to keep some interesting projects in-house to retain the engineers and maintain technical expertise. They also recently instituted a recruitment and retention bonus system and are family/employee friendly practices.
- Level of internal effort project managers have to put into consultant design to get the same level of in-house design quality is high.
- Workload is high – employees donating around 20% of their time – this is affecting morale.

HIGHLIGHTED PRACTICES

- PS&E Development – incorporates internal reviews and incorporation of VE by both internal and consultant staff.
- Partnering Practices – a Liaison committee, consisting of KSDOT engineers and Kansas

Consulting Engineers meets quarterly.

- Construction Certification Program
- Production Control Meetings – project development review process used to discuss status of projects and identify and resolve problems.
- Construction Contract Growth Rate at 2%
- Post Construction Reviews – constructability reviews are performed on all large projects. Design staff is actively involved in reviews – purpose is to learn what is/isn't working.
- City and counties do their own designs.
- Do not generally outsource: geotech because they have had problems; traffic engineering due to long-term liability; or surfacing recommendations.
- On Call contracts–surveys, environmental services, Bridge, traffic studies, construction inspection, Right-of-Way services.

Compilation of Interview Notes - Kansas

Kansas Department of Transportation Interview May 30, 2000

They do not have contracting out goals–only projections.

City and counties do their own designs.

KSDOT does not generally outsource: geotechnical services because they have had problems; traffic engineering services due to long-term liability; or surfacing recommendations.

PE–70-80% ($20-30 million per year)

In addition to that $20-30 million, $12 million goes to In-House Design
Design overhead ranges from 140 - 150%. Originally, they had NTE 140%.

Computer charges used to be overhead – now direct billable.

Construction dollars -- $400-600 million range.

Work off 10 year plan – Legislated 13 billion over next 10 years – 6 to 7 billion for construction program.

CE– All inspection for secondary road projects (city and county) is contracted out. Some major projects have 100% inspection, but Construction management/PE still with DOT. It is left to districts how much and what they want to contract out.

Local projects are 100% outsourced for construction inspection.

Service type–Construction (loaded labor–hourly rate + overhead–use company rate–no limitations on overhead–runs 80-180%)

KSDOT has On-Call contracts for surveys, environmental services, Bridge, traffic studies, construction inspection, R/W. About 4-5 on calls for each functional area.

KSDOT uses other State agencies for archaeology and biology surveys.

Projects are both wholly staffed contracting and also piecemeal.

Are trying to fit people to the current structure, but are becoming more flexible to accommodate individual skills.

Districts do very little design work – mostly construction and maintenance. All Design work is centralized in HQ (whether in-house or outsourced).

Has 9 road design squads–each has 8-10 people and 30-40 projects, of which 8-10 of these projects are done in-house. Project Manager is a senior design leader and is PE licensed – they are ones who mostly oversee consultants. All squad leaders are PE licensed. Use engineers and technicians for oversight of some outsourced work.

Used to have a separate consultant services section, but found that most people who come to KSDOT don't want to manage contracts. Abolished this section and have in-house squads (9) do mix of in-house and consultant management. May have to return to re-establish this section due to workload.

Project Managers decide which projects are contracted out. Outsourced work is piecemeal–not cradle to grave. 90% of environmental work handled in-house. KSDOT does contract out Biological studies.

Have 5 full-time survey crews in 6 state Districts.

Decisions on Core Business/Functions to Retain In-House – In general, KSDOT spends resources on expensive pieces of the puzzle.

Seemed more focused on meeting schedules and workload.

Fund training and attendance at conferences.

Main problems are with turnover and keeping new engineers. Found that young designers want to "do," not manage. Have never tried to staff to 100%, but were concerned about how to keep generation x and y interested in their organization, and ensure they stay long enough to gain expertise. The expertise is important because KSDOT finds that consultants sometimes don't know how to do things the KSDOT way. Also, they are worried that as they ~~you~~ approach 90% contracting out levels, they are not sure how they will handle work.

Try to keep good projects in-house to maintain technical expertise.

Currently, KSDOT has 60 vacant engineering positions.

Instituted a bonus system -- Engineers are given 10% bonus. PE licensed engineers get 15% plus 1% per year for up to 5 years. Signing bonuses are given to new recruits, who must sign a contract (annually renewed) committing them to stay for one year. Money for bonus comes out of KSDOT project funds.

Engineer 1= $33,000
Engineer 2= $34,000

Point of Contact for more information on salaries and bonus pay system –Anne Brunt 785-296-4088 FAX 785-296-0145

Family/Employee Friendly Policies
Expanded Flex-Time
Telecommuting
Adjust duties to allow key individuals to spend more time doing something they like.

Each squad has a senior designer in addition to the squad leader. The senior designer serves as a resource for more junior staff.

KSDOT has 4 phase process (discovery, design, update project to standards, design support for construction).

Discovery phase – scoping review of pre-design issues. 10% of PE cost is discovery phase.

When evaluating for outsourcing – Project goes through discovery phase to look at project for stoppers (problems with scope, schedule, budget). Discovery phase may be performed by consultants.

When project comes up, letter is sent to everyone on pre-qualifications list—internal committee reviews responses and develops short list of 3-5 consultants—committee decides who in this group will be interviewed–consultants ranked after interview—functional groups meet with consultant go through 4 phases (discovery, design, etc.) and negotiate each one.

Bureau of Design decides what they want to do in-house and projects that should go out to consultants. This list is then passed on to functional units (bridge, survey), and they make decisions whether to deliver using in-house resources or by contracting for services. The 9 squad leaders and senior designers meet monthly.

How are decisions (whether to do in-house or not) made–workload capability and schedule driven.

Scheduler: Use CPM scheduling system that does not allocate resources yet.

Pre-Qualification Process–uses a process to annually pre-qualify consultants.

PS&E Development--KSDOT believed they get pretty good design quality during PS&E

development. The main difference is not in the PS&E itself but in the level of effort internal managers have to put into consultant design to get that level of quality. Each functional area reviews. Also use constructability reviews and incorporate value engineering during design–contractor can also make suggestions under VE.

Partnering--In 1995, KSDOT started partnering with consultants. A standard of care policy that focused on cooperation and seeking win-win solutions came out of this. A Liaison committee meets quarterly consisting of KSDOT engineers and Kansas Consulting Engineers.

Construction certification Program. They use service contracts for this work. The increased workload has caused the construction staff to move from being specialists to generalists–they still do have areas in which they are more specialized in.

Post-Construction Review–design goes to the project site to learn what went well/what didn't.

Production Control Meetings (state called this their "salvation" meeting) –hands-on internal staff meet to discuss projects and identify problems–Results of meetings are given to senior managers, who ultimately decide which projects can slip and which the State will provide more resources for. Any problems that cannot be resolved by senior managers go to Program Review (Directors) for resolution. KSDOT believes this allows them to keep projects on track and resolve problems.

Contract Growth/Change Order Rate– 2 to 2.4% very low for the past 8 years. Attributes this figure to good design and partnering with contractors. State and A/E's both have QA process - double-checking process.

KSDOT performs constructability reviews on a few large projects.

KSDOT does not train consultant hires – ask for someone who has skills they require.

They hear that people are attracted to them because they have reputation as a quality organization the does things the right way and trains people. They are usually able to attract quality candidates–keeping them is the challenge.

Target PE goals for in-house work – 5-10% for design, geotechnical, survey, and hydraulics work. For consultants - target PE 6-7% and 10% for bridges.

They have a strategic plan, success indicators, and performance outcomes-- still working on these.

Donated time is around 20% for exempt employees–this is affecting morale.
Increasing program dollars and demands of public are affecting workload.

State Responses to Questionnaire - Kansas

Q - Question ***A - Answer***

Q 1: What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for preconstruction engineering services (road design, bridge design, right-of-way engineering, right-of-way acquisition, right-of-way appraisals, bridge inspection, traffic engineering, geotechnical surveys, materials investigations, wetlands studies, archaeological /biological, landscape design, environmental, corridor studies, photogrammetry, feasibility studies, field surveys, hydraulics and research)?

A 1

Fiscal Year	Percentage
97	2.9%
98	6.15%
99	5.4%

Q 2: What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for construction engineering services (management, inspections, materials testing)?

A 2:

Fiscal Year	Percentage of Construction Budget
97	0.3%
98	0.3%
99	0.5%

Q 3 Why does your department use consultants?

A 3 By state law, there is a limit on available positions and the workload is higher than can be completed by these positions

Q 4: What was your Construction Program level in dollars for FY 97, FY 98, and FY 99?

A 4

Fiscal Year	Dollars
97	626,232,000
98	460,170,000
99	463,528,000

Q 5: If your annual construction budget increases, would you hire more consultants, more in-house staff, or both? Why?

A 5 Hire consultants. By state law, the number of positions is fixed.

Q 6 Is maintaining in-house technical expertise important?

A 6 Yes. Ongoing training of our staff and a mixture of in-house designs and consultant designs.

Q 7 What types of consultant contracts do you use and what approximate percentage are they of the total number of consultant contracts annually for FY 97, FY 98, and FY 99? .

A 7 We use cost plus a net fee on 90% of our design contracts and a loaded hourly rate on 10% of our design contracts and 100% of our construction inspection contracts.

Q 8 Does your Department have an errors and omission policy? (Yes/No) Please explain why.

A 8 Yes. We have a Standard of Care Policy that is used to recover the cost to correct the error.

Q 9 Please describe your experience, if any, with reimbursement from consultants who have committed errors or omissions.

A 9 Most errors are corrected by the consultant doing the required work at no cost to KDOT. However, when reimbursement is being requested, the problem is studied to determine how serious the problem is and how best to fix it. The cost to the consultant is then negotiated. We have had good success in receiving reimbursement from the consultants.

Q 10 How do you use in-house staff to procure consultants?

A 10 Our state law allows quality-based selection of consultants. In-house staff do the prequalification, selection and negotiation with the consultants

Q 11: How do you use in-house staff to manage consultant contracts?

A 11 Each consultant project is assigned to an in-house engineer for review and supervision.

Q 12: Does your Department retain any portion of payments until consultant contracts are successfully completed? (Yes/No)

A 12 Yes. We pay up to 95% of the contract with no retainage, then make no payments until the work is accepted by KDOT. We then reduce the retainage to 1% and hold that amount until the final audit and payment is made.

Q 13 What methods do you use to monitor consultant progress between major milestones?

A 13 Monthly progress reports are required on all projects. In-house project managers also have regular communication with the consultants by phone and e-mail. A project evaluation is completed after field check, office check and construction is completed.

Q 14: How do you determine in-house costs when making comparisons to consultant costs for doing the same work?

A 14 We compare the in-house project activities to the same consultant activities as to the hours required to complete the work. We assume that KDOT supervision will be 10-15% of the consultant hours. Since the State doesn't have an overhead rate, we do not compare the total costs.

Q 15 Are training costs included in your cost comparisons of consultants vs. in-house resources? (Yes/No)

A 15 No

Q 16 Does your Department have training programs for in-house staff who provide oversight/management of consultants? (Yes/No) If yes, please describe.

A 16 No

Kentucky
Interview Summary

On 5/31/00 the FLH Bench Marking Study Team consisting of representatives Dan Alexander, Terri Jurkofsky, Rick West & Ed Calderon met in Frankfort, Kentucky to meet with representatives of the local Department of Transportation.

ATTENDEES

•	Jim Grider	Director, Division of Professional Services	502-564-4555
•	Rick Stansel	Director, Division of Contract Procurement	502-564-3500
•	John Sacksteder	Asst. State Highway Engineer	502-564-3730

We met for a three hours period, reviewing the purpose of the meeting, making introductions, briefly explaining how Federal Lands operates and then how the local Department of Transportation delivers their design and construction program – touching on both in-house and out sourcing issues.

REFERENCE MATERIALS

- Organization Chart - Kentucky Transportation Cabinet
- Memorandum - 2000 Kentucky Department of Highways - CEC Partnering Conf.
- Web site print-out

OVERALL FACTS

- HQ focus is making Districts successful.
- Philosophy is to ensure employees are cross-trained in specialized knowledge areas to avoid getting caught short.
- Kentucky has a $700 million dollar program that will increase by $200 million per year.
- About 80% is contracted out, based on PE cost. KYDOT believes they are maxed out at 80% level.
- Outsourcing decisions are made by the districts and not the central office.
- They do not oversee consultants with a dedicated section.
- Bridge, environment, materials testing, drilling, and GPS work is centralized in HQ.

CHALLENGES

- Environmentally sensitive projects strain resources due to the need for public meetings.
- They cannot find scheduling software that is capable of assisting in balancing a their projects due to the large volume they handle.
- There is no specific training for project managers.
- Many young engineers are lost to higher paying consultant jobs.
- A workload saturation point has been reached and without the gain of expertise they will not be able to manage consultants.

HIGHLIGHTED PRACTICES

- Previously used consultants for CE but the practice was discontinued due to dissatisfaction. Have moved toward QC/QA procedures to give more responsibility to the contractors and negate the need for consultant construction engineering.
- Most AE contracts are lump sum.
- Statewide master agreements are used for services such as environmental, geotechnical, bridge, surveys, right-of-way.
- Use a scholarship program, where the student signs a contract with the DOT, through the University of Kentucky to develop and attract engineers. KYDOT jointly develops curriculum with University staff.
- Hold post-construction reviews to determine "lessons learned."
- Use liaisons between the districts and central office to troubleshoot and assist in maintaining the project schedule.
- Hold quarterly progress reviews to determine project status.
- Assign a team to do scoping phase 1 year prior to design phase—design portion (managed by the District). Project Managers responsible for teams through construction support and sometimes through operations.
- PM's have the responsibility for in-house and outsourced projects.
- Hold environmental summits and partnering conferences.
- Use a school outreach program to attract youth to engineering fields.
- One of 4 pilot states involved in Context Sensitive Design demonstrations –theirs is in conjunction with the University of Kentucky. See University of Kentucky website: http://128.163.155.75/FLEXD.htm
- Shorter fuse projects go to consultants. In-house projects are less time sensitive.
- Work is generally contracted out cradle to grave – not piecemeal.
- Districts generally hold bridge replacements and safety projects–put more complex projects out to consultants.
- Contract Mod authority – District Project Managers have the authority to endorse if under $50,000. Over $50,00 goes to Central Office.
- Planning and scoping phase is 6-9 months and includes project development team.
- Require District design staff to attend context sensitive design classes

Compilation of Interview Notes - Kentucky

Kentucky Department of Transportation Interview on May 31, 2000

Organization Chart was provided. Website Address: www.kytc.state.ky.us

The HQ focus, according to Sacksteder is making Districts successful, rather than a focus on compliance. Two years ago, 350 additional FTE's were approved (4900 employees today). The Department stated they are maxed out at 80% level of outsourcing.

*Kentucky stated that Louisiana had outsourcing at 90%, but they are reducing that percentage because they believed it was too high – suggested we visit.

Program Size 700 million + 200 million per year over next few years.

Strategy: Larger projects and shorter fuse projects go to consultants. In-house projects are less time sensitive and typically involve smaller jobs and bridge replacements. Factors affecting workload include increased program and increased environmental emphasis because of workload associated with public meetings (mentioned Context Sensitive design)

PE–70-80%

CE--Near zero for Construction–KYDOT uses consultants only on projects requiring expertise outside scope of internal staff. Reason: About 10 years ago, were using consultants -- and both in-house staff and contractors were unhappy with consultant CE. According to KYDOT, consultants were less sure of procedures and tended to be more restrictive as a result. Instead of contracting out the inspection and management, KYDOT worked on streamlining internal procedures and on including work operations in contract that were previously done by internal staff–e.g., went to QA process with testing and put that out to contractors.

Work is generally contracted out cradle to grave – not piecemeal.

No retainage fee held. Pay for work done – no incentives/disincentives.

Districts generally hold bridge replacements and safety projects–put more complex projects out to consultants.

On calls for geotechnical, photogrammetry, environment, surveys, and R/W – $50,000 max.

Rates
150% max Overhead
10% profit/fee on cost plus
15% profit/fee on lump sum

Predominately lump sum contracts.
Two year audits on overhead rates. Maximum escalation clause of 5% per term.

Statewide Master agreements for services like environmental, geotechnical, bridge. Set up for 1 million each.

Staff size of 10,000 decreased more than 50% from 1978. Today KYDOT has a staff of 4800-4900 employees.

6 year plan–50- 60 projects to be advertised this year. 150 to 200 new projects each year. Will be on the website.

Process is decentralized; each district does own workload analysis and makes decisions on in-house vs. contracted out work. Long-term Planning—Team assigned to do scoping phase 1 year

prior to design phase—design portion (managed by the District). 98% of projects are handled by Districts.

12 Districts – All districts have design staffs. Two larger districts have 20-25 employees (6-8 are PM's); 6 districts have 9-12 employees (approx. 3 PM's) and 12 have about 6 employees (1 or 2 PM's) working in design. Other functions decentralized include, including survey, and construction. Construction staff consists of approximately 70 Resident Engineers and 300 construction inspectors. PM's have responsibility for in-house and outsourced projects.

Bridge, environment, materials testing and drilling, and GPS work is centralized.

Contract Modification authority – consultant proposes reason for modification– District PM has authority to endorse if under $50,000. Over $50,00 goes to Central Office. Construction mods are listed and updated on website.

There is a process map/flow chart on the KY website.

Districts control division of work–some designate one person to be consultant manager–others spread the consultant supervision work among Project Managers. There is no centralized plan to have separate A/E team.

Project Managers (PM) responsible for projects and teams through construction and, sometimes, through operations. PM's report to HQ to discuss project status every 3 months (Quarterly Progress Reviews). They use two reports to manage work – "let date" report and action report. Project Management is by matrix – the District engineer determines who will be on each team and team stays intact through construction.

Consultants (two large statewide firms) assist in planning and scoping – use a 6-9 month time frame and include public meetings in the process. Planning report includes whole team involvement.

Use FEMA for assistance in some work – FEMA charges a fee. Plan to start using Fish and Wildlife Service also.

Some technicians are project managers, performing same functions as engineers. However, engineers are paid more for the same work.

Scheduler – use tool like MicroSoft Project, but most Districts do scheduling by hand using critical path method–found that software is incapable of assisting them in balancing so many projects. Statewide program is too large for any scheduling tool.

Internal overhead– about 4 or 5 years ago, State did an in-depth review on internal overhead costs–came up with 85% (includes electric bills, insurance, etc.)

No specific training given on contract management.
No specific formal training given to Project Managers – mentoring only.

Philosophy is to spread knowledge so you don't get caught if one or two people leave who have the specialized knowledge. They are losing a lot of younger engineers to consultants because entry pay is not comparable. To cope with this, they are implementing salary increases, outsourcing more work, and have implemented a scholarship program (see below). Sacksteder feels they are reaching a point of saturation in terms of being able to handle workload. Need to be able to retain engineers so they gain expertise and can manage consultant work.

Scholarship Program - with the University of Kentucky. KYDOT is actively involved in developing curriculum. 80% of new engineers come from the Scholarship program. Program brings in about 20-30 new engineers each graduating cycle. Retention rate is about 65%. The student signs contract, committing one year of service for each year KYDOT pays for total of 5 years. Student has the option to buy out. (KYDOT pays approximately $4,000 per year). Some consultants are paying the "buy out" fee to recruit KYDOT employees.

Mid-level engineers are receiving comparable pay, but entry level are not.

According to KYDOT, the quality of consultants is a mixed bag. Some are great; others need a lot of hand holding.

All major projects have post-construction reviews to determine "lessons learned." In the contract, KYDOT establishes up-front that they will have X number of meetings. So, even though this meeting takes place after contract closes, contract covered/paid for it. KYDOT says their experience is that contractors want these kind of meetings.

Liaison Used to Keep Process Moving –Project Management Coordinator (PMC)-- there are 6 of these positions in Frankfurt office–role is to be liaison between district and central office. On same level as project manager. Has big picture view and is aware of issues that may cross projects. Meets with State Highway Engineer to brief him/her on issues. Districts have line authority from project scoping through construction. This position (PMC) serves in an advisor/troubleshooter capacity.

Quarterly Progress Reviews with each District –purpose is to see if projects are on target as far as scope, schedule, and budget. Action reports result from meetings. PMC monitors to ensure actions are being completed, or to identify and troubleshoot reasons for delays.

Pre-Qualification Process – A/E's are pre-qualified, same as construction contractors. For example, bridge work needs to have a bridge pre-qualified constructor. Have class A and class B contractors – trying to get them to 80% level. Legislature mandates pre-qualification of contractors. Companies must be solvent to be on pre-qualification list. Pre-qualification process is on website.

Environmental Summit –All resource agencies come in for discussion.

Partnering Conference –annually. Full Training Sessions (5 concurrent sessions). Attendance by all design staff, active consultants. This year–August 8, 9, 10. The 8/8 session is for FHWA and KYDOT only.

KEEN (KY engineering Network) -- School outreach program to attract youth to engineering fields.

All District design must attend context sensitive design training.

Use Design Intergraph for 3D modeling. Use In-Roads as their design software.

Measures – mostly time measures. Will have quality measures by July 1.

"Context Sensitive" Design – one of 4 pilot states. See Univ. of KY website: http://128.163.155.75/FLEXD.htm

Restrictions: No contract modifications are allowed within 6 months of contract award. There will be a hearing to determine if this should be changed to 3 months.

State Responses to Questionnaire - Kentucky

Q - Question ***A - Answer***

Q 1: What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for preconstruction engineering services (road design, bridge design, right-of-way engineering, right-of-way acquisition, right-of-way appraisals, bridge inspection, traffic engineering, geotechnical surveys, materials investigations, wetlands studies, archaeological /biological, landscape design, environmental, corridor studies, photogrammetry, feasibility studies, field surveys, hydraulics and research)?

A 1 Design funding has varied from 5.5% to 8.5% of our total annual budget over the last four years. Approximately 80% of all design funding goes to consultants. The Department keeps most of the smaller projects, such as bridge replacements, in house. Most major projects are done by consultant. By projects, approximately 50% of all projects are done by consultant.

Q 2: What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for construction engineering services (management, inspections, materials testing)?

A 2: Construction engineering are done on very few projects. The only projects in recent years where construction engineering was utilized involved special expertise; i.e. - a major retaining wall in a highly slide prone area. Therefore, the % is very minute.

Q 3 Why does your department use consultants?

A 3 Consultants are used to supplement the lack of staff required to meet project schedules. Consultants are also used to provide experience and expertise in specialized areas.

Q 4: What was your Construction Program level in dollars for FY 97, FY 98, and FY 99?

A 4 Our construction program for the last three years is as follows:
1997 - $564 M 1998 - $634 M 1999 - $690 M

Q 5: If your annual construction budget increases, would you hire more consultants, more in-house staff, or both? Why?

A 5 We would probably hire more consultants. By legislation, our staff is capped. Virtually all positions are presently filled which allows little opportunity for increased staff.

Q 6 Is maintaining in-house technical expertise important?

A 6 Maintaining expertise is very important. We do offer considerable training and mandate that every person in the Department receive at least 21 hours of training each year. We also have an Engineering Scholarship program with the University of Kentucky which brings a considerable number of young engineering staff to the Department each year.

Q 7 What types of consultant contracts do you use and what approximate percentage are they of the total number of consultant contracts annually for FY 97, FY 98, and FY 99?

A 7 Virtually all consultant contracts are on a lump sum basis. Lump sum contracts are utilized on every project where a scope of work can be generally defined. Cost plus contracts are used only when there are a large range of alternatives or other elements exist that do not permit a clear definition of work. Cost Plus contracts occur on probably less than 2% of our consulting work.

Q 8 Does your Department have an errors and omission policy? (Yes/No) Please explain.

A 8 Consultants are required to maintain liability insurance. Work that is determined to be in error or as a result of omissions by the consultant is held to be his responsibility. We believe that this increases the responsibility and culpability of the consultant for his work.

Q 9 Please describe your experience, if any, with reimbursement from consultants who have committed errors or omissions.

A 9 The consultant is responsible for providing any re-design required to correct the errors or omissions. If the consultant is clearly at fault and the re-design results in a change in construction or claims by the contractor for delays, the consultant can be held responsible for the associated costs. This latter course of action has seldom been used as the consultant's sole responsibility for errors is frequently hard to prove. The Department does have review processes at all phases, generally, and thus has some involvement in the end product for every project.

Q 10 How do you use in-house staff to procure consultants?

A 10 We have a professionally-selected consultant process, consisting of five members for each project. Of the five members, two are representatives of the user Division (or Divisions if there major work is involved in more than one area). Two others are from a pool of six in-house engineering staff that are randomly drawn to serve on each selection committee. The remaining member comes from a pool of three recommended from the Governor's office. These three are for the most part retired engineering staff.

Q 11: How do you use in-house staff to manage consultant contracts?

A 11 In-house staff manages all consultants projects. Generally a project manager is assigned from our District staff. Special assignments do occasionally occur on special projects or when District staff is considered to be incapable of handling a major project, based on their present workload.

Q 12: Does your Department retain any portion of payments until consultant contracts are successfully completed? (Yes/No)

A 12 The Department just eliminated retainage from contracts in the past year. It was determined to be an ineffective way of controlling the consultant. The retainage had been on a sliding scale as a project progressed. However, if the consultant for some reason was unable to finish a project, a study was done to determine the amount of work finished. The retainage never entered into the picture. As a project was finished the amount of retainage became so low that there was no incentive for it to be a control. We have used an evaluation system for several years that aids in the consultant selection process. If a consultant's final plans are not adequate, his evaluation will reflect any problems that has occurred. The consultant also is expected to correct any errors that are found during the final project phases prior to letting.

Q 13 What methods do you use to monitor consultant progress between major milestones?

A 13 We use monthly reports from the consultant to monitor what work has been accomplished in the past 30 days. This is submitted with he consultant's pay estimates. If the project manager has any concern for what has been accomplished in a given month, he may opt to hold a meeting with the consultant to view his progress. This meeting may be held in the consultant's office.

Q 14: How do you determine in-house costs when making comparisons to consultant costs for doing the same work?

A 14 We have assumed similar rates of pay for in-house and consultant staff and have assumed other costs of operation, such as training, are similar. The costs are then compared to our overhead versus the average overhead rates for consultants plus their percentage of profits. Our overhead rates are running around 85% compared to a consultant average of about 135%. Profits are set at 15% on lump sum contracts and 10% on cost plus contracts

Q 15 Are training costs included in your cost comparisons of consultants vs. in-house resources? (Yes/No)

A 15 See question 14.

Q 16 Does your Department have training programs for in-house staff who provide oversight/management of consultants? (Yes/No) If yes, please describe.

A 16 No, we have not established any direct training courses for consultant management/oversight. Consultant management is learned more from informal mentoring among our staff.

Maryland
Interview Summary

On 5/19/00, the FLH Bench Marking Study Team, consisting of representatives Dan Alexander, Ed Calderon and Rick West, met in Baltimore, Maryland to meet with representatives of the Maryland Department of Transportation.

ATTENDEES:

• Liz Homer	Deputy Administrator, SHA	410-545-0402
• Francine Shaw-Whitson	Asst. Div. Administrator, FHWA	410-962-4440
• Carl Vogel	Asst. to the Chief Eng	410-545-0363
• Glenn C. Vaughan	Bridge Division	410-545-8070
• Robert Harrison	Office of Construction	410-545-0072
• Chris Larson	Office of Real Estate	410-545-2828
• Bob Douglass	Highway Division	
• Paul Becker	Consultant Services Division	410-545-0435
• Bob Gay	Consultant Services	410-545-0433
• Max Azizi	FHWA, MD	410-962-4342
• Peter Kleskour	FHWA, MD	410-962-4342

We met for a three hour period; reviewing the purpose of the meeting, making introductions, briefly explaining how Federal Lands operates, and then how the Tennessee Department of Transportation delivers their design and construction program, touching on both in-house and out sourcing issues.

REFERENCE MATERIALS

- Procedures for Pursuing Reimbursement from Design Consultants
- Four Year Business Plan
- State Highway Administration - SHA Rating of Consultant - Calendar Year
- Architectural & Engineering Consultant Selection - Internal Guidelines

OVERALL FACTS

- Winner of the Governor's Excellence Award – the state version of the Baldridge Award.
- Size of Program: From 1997 to 1999, has remained relatively stable in the 600 million dollar range.
- 50% of design projects numbers are contracted out. However, this equates to 70% of the design dollars.
- 85% of consultants they hire have experience working in-house before becoming consultants.
- Measurement of success is keeping staff and advertising on time.

CHALLENGE

- Competition for Staff -- The Department is unable to retain staff beyond 5 years – consultants hire them. They say they tend to lose their best employees to consultants – those that stay do so to maintain a certain quality of life.

HIGHLIGHTED PRACTICES

- Concept of Building a structure around the employees you have. The Department's policy is to match the people they have to the job.
- Overtime and Comp time maximum restrictions – these are capped to retain quality of life.
- All types of outsourcing models are being used, including a hybrid process similar to design/build.
- 85% of Maryland contracts are open end types. - Takes too long to do project specific task orders.
- Outsourcing Strategy – Maryland DOT targets larger jobs with lots of plan sheets and time sensitive jobs for outsourcing. The smaller jobs with extensive customer interaction are done in-house.
- Graduate Engineer Training Program – 4 year program
- Recruit new engineers every year from MD colleges
- Offer training to consultants.
- Technical Track Classification – pay/career track that allows technical experts to be rewarded without having to move into management.
- Use a pay banding system with three levels: Entry, Team Leader, National Recognition
- Negotiate A/E by phases.
- MDDOT has a consultant salary rate cap of $55.00 per hour. They are mindful of their employees salary. In-house and out-sourced inspectors are paid the same.
- Use of regular meeting process to discuss and resolve project specific issues. A management meeting (FRAT) occurs regularly to discuss more global issues.
- Categorize change orders by reason to identify trends.
- They promote staff quickly in order to retain in-house expertise and mentoring.
- They allow in-house design staff to select their preferred projects.
- They don't perform detailed reviews. Instead, they perform - Milestone, quality, and constructability reviews. They do this for both internal and external designs

Compilation of Interview Notes - Maryland

They have won something similar to the Baldridge Award, their "Governor's Award".

Maryland has always done a lot of contracting out.

50% of design projects numbers are contracted out. However, this equates to 70% of the design dollars.

85% of consultants had experience working in-house before moving on to consultants.

Designers get to select the project that they want.

MD builds their organization structure around the people that they have. And They were very concerned about "quality of life".

They have a maximum overtime and compensatory time level.

Bridge is contracting out 60%*. They have 10 three person teams.
* Wilson bridge is not included in the numbers.

They have no AE management office.

85% of Maryland contracts are open end types. - Takes too long to do project specific task orders.

Most jobs are lead by a Highway Person (PM). Projects with incidental highway costs are sometimes lead by bridge.

All types of contracting out models are being used at MD. Including Design build.

Entry level recruitment is key..can't buy in at the higher level...can't even keep their five year veterans - consultants hire them away.

Success MEASUREMENT: IF we keep staff and advertise on time we are successful.

Critical Mass is important - the experienced people are moved to higher levels quicker to retain them. Then these talents can pass on or mentor the new recruits.

Centralized procurement

Maryland targets larger jobs with lots of sheets to go to Consultants. The smaller jobs with a great deal of customer interaction are kept by MDOT. If a job needs to be accelerated, they use consultants.

They have 6 year budget/plan.

No Retainage held for contract consultant work.

$56 Million over 3/4 of the year went to 154 firms. The bulk of that went to 20 firms. Of the $56 million, $43 million went to Design and $12.5 million went to construction inspection.

They have a lot of design work that does not go to construction due to funding restrictions. These jobs become shelf projects.

Construction Inspection; 244 inspectors (in-house) and 250 consultant inspectors.

$550 million construction program. At least one state representative (RE) per construction job.

They recruit engineers on a yearly basis. They also have a Graduate Engineer Training Program (4 year program). They do not have a scholarship program.

MDDOT does not contract out property acquisition. They do use consultants for fee appraisal, closing out, and title work.

[NOTE: MD Refer: Nationwide Study done (California to Massachusetts) - 55% was a bench mark for a maximum amount that should be contracted out

MDDOT allows for a maximum overhead rate of 130%. They also have a consultant salary rate cap of $55.00 per hour.

They are mindful of their employees salary. In-house and out sourced inspectors are paid the same.

Training budget is between $1.2 - 1.4 million. Training costs are not captured in the training budget.

MDDOT feels that if their people are leaving, it is more of a problem than just Money!

MDDOT - training is offered to consultants and in-house. Training is for everybody who works for the department.

People that they lose to consultants are their best and instead of hurting morale, MDDOT works hard to celebrate their good fortune. Those that stay, stay to keep a quality of life.

They are fortunate that they get those people who were super stars (in-house) back to work for MDDOT as consultants

"They match the people with the Job." - They were very specific that they feel strongly that the organization structure can not be devised with hopes of filling it. The focus must, in their opinion, be on the people you have. "Build the structure around what you have".

MDDOT supports a Technical Track Classification. This classification allows technical experts to be rewarded with out moving into management.

Money is not always the key, sometimes a little more recognition keeps MDDOT employees content.

MDDOT supports Pay banding. They use three levels.
12 - 18 months...entry Mid level - Team Leader
Superstar - National Recognition.

Question: 5e-5f - PM's have 2-3 major projects, valued at about $60 million, or 7-8 smaller projects.

Managers review schedules weekly.

They use Excel as a Budgeting tool.

Negotiate AE by phases....0-30, 30-70, 70-100

They don't use design build, but they have a hybrid process.

Change orders are categorized by reason to identify trends.

MDDOT uses 5 phases in project delivery. Design contracts stay open until the construction is complete.

Schedules do not work well in design. Routine meetings are the best way to go. In addition, meetings are held on an Issue specific basis.

FRAT- They have monthly FRAT meetings where upper management discusses the global issues. If the cross- functional meetings were not effective, it would come to the FRAT meeting.

No formula for assigning projects

One inspector is assigned to projects for each $750,000 to $1 million construction value.

Cost Plus is used but they want to do more lump sum contracts.

When stipends are allowed, they are considerably less than the cost of the level of effort required to produce the product.

In house Construction section manages AE construction inspection

They don't perform detailed reviews. Instead, they perform - Milestone, quality, and constructability reviews. They do this for both internal and external designs.

Use consultant ratings system for performance evaluation.

Used to have quarterly meeting to discuss problems, but other meetings (Monthly frat AND Project specific meetings as needed have help to eliminate the need for the quarterly meeting.

Quarterly meetings had many breakdowns and resulted in escalated tempers.

State Responses to Questionnaire - Maryland

Q - Question ***A - Answer***

Q 1: What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for preconstruction engineering services (road design, bridge design, right-of-way engineering, right-of-way acquisition, right-of-way appraisals, bridge inspection, traffic engineering, geotechnical surveys, materials investigations, wetlands studies, archaeological /biological, landscape design, environmental, corridor studies, photogrammetry, feasibility studies, field surveys, hydraulics and research)?

A 1

	FY 97	**FY 98**	**FY 99**
Right of way	5%	2%	0.8%
Planning	60%	60%	60%
Hwy Design		figures not available	
Bridge		figures not available	
All Areas	8.75%	8.8%	8.95%

Q 2: What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for construction engineering services (management, inspections, materials testing)?

A 2:

	FY 97	**FY 98**	**FY 99**
All Categories	1.8%	2.38%	2.42%

Q 3 Why does your department use consultants?

A 3 Consultants are used to handle the extensive SHA workloads and to assist SHA with peak loads. Occasionally, Consultants provide specialized technical expertise

Q 4: What was your Construction Program level in dollars for FY 97, FY 98, and FY 99?

A 4

	Total Capital Program	**Neat Construction Program**
FY 97	$594 M	$357 M
FY 98	$557 M	$332 M
FY 99	$620 M	$342 M

Q 5: If your annual construction budget increases, would you hire more consultants, more in-house staff, or both? Why?

A 5 Both. Would attempt to maintain expertise in-house, while staffing for peak loads through consultants. Greater percentage of consultants to avoid layoffs or under utilized staff during smaller budget periods.

Q 6 Is maintaining in-house technical expertise important?

A 6 Maintaining in-house technical expertise is important. To ensure adequate levels of expertise, in-house training and cross training between discipline areas, procurement of relevant courses from outside vendors, and consultant training of in-house staff is pursued.

Q 7 What types of consultant contracts do you use and what approximate percentage are they of the total number of consultant contracts annually for FY 97, FY 98, and FY 99? .

A 7 The number and value of consultant agreements for SHA for the last three (3) Fiscal Years are:

Fiscal Year	# of Contracts	$Value
FY 97	101	$81,907,367
FY 98	137	$76,715,599
FY 99	144	$135,557,343

The types of A/E contracts the SHA enters into are Open-end or Site Specific. Planning:, Engineering and Environmental, Environmental Documents, Noise Analysis, Air Analysis, Archaeological, Natural Environmental, Historical Analysis, traffic Forecasting, Socio-Economic, Traffic Counts

Design:	Highway Design
Hydrology/Storm water	Value Engineering
Subsurface Utility	Field Surveys
Metes and Bounds	Noise Abatement
Landscape Architecture	Wetland/Stream
Architectural Design	Groundwater
Bridge Design	Bridge Hydrology
Emergency Bridge	Bridge Condition Inspection
Traffic Engineering	ITS
Construction:	Construction Inspection

Construction Contract Claims

For SHA the approximate percentage of the total A/E contracts (by $) to the three main categories are as follows:

	Planning	Design	Construction
FY 1997	19.7%	40.1%	40.2%
FY 1998	18.2%	72.1%	9.7%
FY 1999	21.1%	70.3%	8.5%

Q 8 Does your Department have an errors and omission policy? (Yes/No) Please explain why.

A 8 Yes. The goal is to collect any monetary loss incurred by the MDSHA as a direct result of a plan or design error.

Q 9 Please describe your experience, if any, with reimbursement from consultants who have committed errors or omissions.

A 9 Reimbursements have been limited and Consultants have been reluctant to admit liability. However, we have been able to collect some larger amounts of money when the error is grossly apparent.

Q 10 How do you use in-house staff to procure consultants?

A 10 The SHA Consultant Services Division is responsible for all SHA A/E Consultant Procurement and contract preparation. The procedures are set forth in COMAR 21.12.02

and require competitive technical/negotiated price basis of selection. In-house staff is used to evaluate Expressions of Interest and develop Reduced Candidate Lists and also to review technical proposal submissions. All A/E selections are presented to the Transportation Professional Services Selection Board (TPSSB) for approval. This is a five (5) member board which includes two (2) Public Members.

Q 11: How do you use in-house staff to manage consultant contracts?

A 11 Consultant managers are required to prepare independent work hour estimates, coordinate and direct the efforts of the consultants with those of the internal staff.

Q 12: Does your Department retain any portion of payments until consultant contracts are successfully completed? (Yes/No)

A 12 No.

Q 13 What methods do you use to monitor consultant progress between major milestones?

A 13 Percent of work complete versus Percent of contract total billed, along with written progress reports, visits to the consultant office and project progress meetings.

Q 14: How do you determine in-house costs when making comparisons to consultant costs for doing the same work?

A 14 On the initial projects, estimates are developed and submitted in a sealed envelop to the Transportation Professional Services Selection Board prior to the requesting of Price Proposals from consultants. To prepare the estimates, work hours or personnel distributions are developed by the technical offices and submitted to the Office of Finance and Information Technology for application of costs and then forwarded to the Consultant Services Division for transmission to the TPSSB. Work hour derivations and cost functions are based on past experience. For individual project assignments to existing agreements, work hours and cost functions are also estimated based on past experience.

Q 15 Are training costs included in your cost comparisons of consultants vs. in-house resources? (Yes/No)

A 15 No, training costs are not included in cost comparisons of consultants vs. in-house resources.

Q 16 Does your Department have training programs for in-house staff who provide oversight/management of consultants? (Yes/No) If yes, please describe.

A 16 Fragmented training is available. A Project Planning Division interdisciplinary team developed a booklet entitled, "Consultant Management and Invoice Processing Guidelines" for use by staff and provided training sessions on its use.

Maryland DOT sponsors three (3) Modules of Procurement Training which are available to all Maryland DOT personnel.

Module I – Overview	1 day
Module II – Procurement Processes	3 days
Module III – Project Management and Contract Administration	2 days

Nevada
Interview Summary

On 5/23/00 the FLH Bench Marking Study Team consisting of representatives Howe Crockett, Rick West, Ed Calderon, & Dan Alexander met in Carson City, NV to meet with representatives of the Nevada Department of Transportation.

ATTENDEES:

•	Todd Montgomery	Project Manager	775-888-7318
•	Ruedy Edgington	Asst. Dir - Operations	775-888-7440
•	Terry Philbin	Construction & Bridge Eng, FHWA	775-687-5323
•	Wayne Kinder	Asst Chief Road Design Eng	775-888-7490
•	Parviz Noori	Asst Materials Eng	775-888-7786
•	Rand Pollard	Consultant Coord Eng.	775-888-7590
•	Stephen Lani	Principal Construction Eng	775-888-7460
•	Jan Christopherson	Administrative Services Officer	775-888-7070
•	Mark Elicegui	Construction Eng	775-888-7460
•	Chris Beck	Asst Chief Materials Eng	775-888-7520

We met for a three hours period, reviewing the purpose of the meeting, making introductions, briefly explaining how Federal Lands operates and then how the Nevada Department of Transportation delivers their design and construction program – touching on both in-house and out sourcing issues.

REFERENCE MATERIALS

- Organization Chart - DOT and Roadway Design
- 2000 - Anticipated Crew Augmentation - Finalized
- + P.D.F.S. Work Sheets
- Plans Check - Discrepance Report
- Plans Checking Guide
- Consultant Agreement Procedures - Nevada, DOT

OVERALL FACTS

- Size of Program: From 1997 to 1999, ranged from 145 to a high of 290 million in 1999.
- Contracting Out Levels: Outsourcing of construction engineering work has risen from a 8% to 44% of CE dollars. Close to 80% of PE is outsourced.
- Department has 4 projects over $100 million (construction costs) that are outsourced.

CHALLENGES

- Maintaining technical expertise viewed as no longer possible. The Department has ideas, but nothing, so far, is being implemented other than trying to target certain projects for in-house staff.
- Pay Differences between NDOT's staff and the consultant staff -- Consultants pay 20 – 40% more for technicians and engineers. This makes it difficult to attract or retain good employees.
- Twenty two design positions remain vacant due to inability to attract people.
- Employee perception that quality is suffering due to fewer quality checks, inability to staff with experienced people, and increasing program size.
- Consultants lack of good understanding of NDOT procedures and policies – belief is that it requires more staff time to manage consultant services than to personally perform the work.
- Consultants often don't incorporate changes they are given due to time pressures.
- Super Project Managers are competing for use of limited cross-functional resources. Project Managers are "fighting" for use of limited cross-functional resources.
- Past decisions made with regards to in-house vs contracted out were made from a functional perspective only and this has hurt them technically.

HIGHLIGHTED PRACTICES

- Nevada has a separate section that manages consultant administration. The Pms manage the day to day operations of the consultants.
- Agreement Services section staffed with 4 employees to prepare RFP's, perform initial review of proposals, and manage consultant pre-qualification and insurance verification programs.
- Some design/consultant contracts stay open through completion of construction.
- Super Project Managers continue to stay involved through construction phase by attending construction meetings on weekly or monthly basis.
- The work load is not distributed evenly between the various project managers (PM). The PM writes the scope of work and relies on in-house disciplines for input.
- They use a database/schedule that reports advertisement date and 100% PS&E date.
- Use on-call contracts for design, construction, and miscellaneous work.
- They do most geotechnical work in house.
- Negotiate hours only and not labor rates.
- Hire Consultants within 3-5 months of RFP.
- Do not allow same consultant to provide both design and construction inspection.
- Training provided to consultant construction staff – one day on NDOT documents, procedures, and chain of command.
- Use side-by-side training for consultant and state testing technicians.
- Both in-house and consultants are required to use the same State drafting standards, CADD standards, and Quality Check-lists.
- Focus on construction review at the 20-30% design phase. Consultants use experienced contractors or independent contractor teams for constructability reviews.
- Construction contracts have a 3% Contingency.

Compilation of Interview Notes - Nevada

Nevada Department of Transportation - Interview May 23, Carson City

Calendar year 1999 PE costs actually paid to
consultants vs PE costs charged to in-house divisions:

Consultants:	$19,520.000	78.6%
In-house:	$5,325,000	21.4%
Total:	$24,845,000	

Contracts before 1970 were done on an individual basis by each division. In 1990 they put together Agreement Services to handle this. They have a very detailed manual(1997) on how the process works. They use Agreement numbers and track funds. They track all consultants.

FLOW: How - Planning develops a list through the STIP working with locals. Show funding. One year budget approval. Have budget authority. State has reimbursable authority. They can borrow on state or federal funds - vice/versa.

PS&E - Focus on 3 year program. Long term program is approved in a 1 year budget which includes Environment, etc.

$200-300 million projects: Work with a 5 year budget and keep track yearly.

They work with a 1, 3 &10 year plan. Program for PE & RW & then come back and program the balance.

Super Projects - Large or complex ~$100 million and greater
Could be based on cost or need. Goes through development with oversight and then back to construction. These are done cradle to grave. A Project Management Division was created in 1998.

There are five Project Managers (managing consultants) for the super projects that are generally over $100 million. One manager has a $200 & $250 million project, but this is not typical. One has two Environmental Impact Statement projects.

DOT rarely farms out R/W acquisitions. Some R/W plans and appraisals are contracted. Environmental Services are rarely consulted out.

Construction: The Project Manager (that oversees the project's development) comes to construction meetings weekly or monthly. At this point the design consultant is only a liaison.

Design consultant contracts stay open through completion of construction.

Dollar figures presented in the reply to the questions were for all CE cost per calendar year.

Total Construction: 1997 - $145 million, 1998 - $205 million, 1999 - $290 million

Work Load: The work load is not distributed evenly between the various project managers (PM). The PM writes the scope of work and relies on in-house disciplines for input, etc.

All Project Managers have the same level of experience but different levels of responsibilities.

Tools: They use Access and built a database/schedule that reports ad date and 100% PS&E date. They also use Scheduler 7 and Primavera.

Each Design PM (8 total) has three squads of three each plus one drafter.

Super Project Managers are competing for use of limited cross-functional resources.

New Organization:
Now a separate section manages consultants. They feel this works much better. They feel it is difficult to manage consultants and in-house work at the same time.

They have 11 consultants on call for freeway design work and 12 for non-freeway work. Last year they had 20 task orders for non-freeway work (a $10 million annual program). They have an internal policy of $1 million limit for on-call agreements and $300,000 limit per task order.(At 10% PE - limits contracts to $3,000,000 construction value). They have exceptions 1/3 of the time. Exceptions means that they must go outside the normal process which takes additional time and is perceived as unnecessary.

On-call is like IDIQ - No guarantee of work(no Minimum Guarantee). Agreements are in place at the start of the 2 year period. Negotiate prices as work is handed out. A ranked list is used. However, the PM must justify why a particular Consultant is used based on geographic locations and other factors. Negotiate scope before costs. An independent estimate is done and the consultant does a cost proposal and then the two are compared and negotiated as required.

Negotiate hours only and not labor rates. A firm must be more technically superior to offset lack of quality.

Use a max of 150% O.H. for state projects. Non-state do a pre audit by internal audit section.

Cost plus fixed fee is typical. 6-15% fee
Some Lump Sum ~ maybe 2%
PE costs run 6-10% of construction costs
In house design groups design 20-30 projects per year. Consultant groups also have 20-30 design projects plus 10 - 20 scoping and Landscape Architect projects per year.

In house decides which projects go to consultants. It's sometimes beyond their in-house expertise or no one has the time to work on the project. The small projects typically stay in house. One method of work distribution is by giving a design to a volunteer for that particular project. If they must expedite a design, they keep it in house.

Timing and workload are factors in distribution in or out of house.
They have volunteers for many projects.

Other factors on going out are if the need is immediate and if it is in a speciality area. Usually goes to an RFP if specialty.

They try to keep projects in house that give them the most broad based technical expertise.

They don't keep the little "chicken" jobs because it helps morale.

They made a specific comment about how in the past the decisions made with regards to in-house vs out sourced were made from a functional perspective only and that this has hurt them technically

Takes more time to manage a consultant project. Coordination for in-house projects is much easier and quicker.

They do most geotech work in house and Geotechs don't like to review consultants work.
In general, they don't have any problems reviewing Consultant's work.

The state uses sub-consultants for coordination and uses some in-house consultants.

Construction:
The same consultant is not allowed to do both design and construction inspection.

Inspection Services: Quality-based
Develop an annual plan based on project schedules.
Put out a package for inspection services and compile a ranking list.
Develop a short list from 30 - 35 proposals.
Some firms only prepare a proposal for augmentation services. (Augmentation is supplementing NDOT staff with inspection services on a project).

State has a list of 40-50 firms that are pre-qualified to perform full construction contract administration.

They also have 200 construction engineering/construction inspection (CE/CI) firms available to perform on-call work (IDIQ)

2 Year On-Call program:
An NDOT technical committee looks at the program and makes a decision on how many firms to be on the short list. The list usually consists of 12 - 15 firms. It then goes to 2nd committee for final ranking. Firms are picked based on quality and listed in that order. The Director approves the program.

Have 22 Resident Engineer Construction crews (12-15people) in the field working for 3 districts.

RE's have more than 1 contract.

Selection of Project to be staffed wholly by consultant services: Large, rural, independent or isolated contracts are the ones usually left so they are given solely to consultants. The consultant has an RE and an NDOT RE acts as a contact. The consultant provides all services including testing. NDOT had 4 of these type contracts last year.

State uses other agencies (local and others) to augment their forces.

Augmentation: Evaluate needs and work with Districts & RE's on getting extra help.

A full day of training is provided to the inspection services employees on NDOT documents, procedures, and chain of command. They also request the consultants understanding of NDOT methods in the RFP.

There is no plan to maintain critical construction mass.

Impacts to the construction Program: NDOT materials testers attend a 6 week course. If consultants don't attend this training there is often a discrepancy. Now they attend training together so there are fewer problems and communication is improved.

Morale:
Difference in pay causes dissent. They are having trouble keeping technicians and professionals because consultants pay 20-40% more than NDOT. A NDOT technician must often train a consultant that is making a higher salary. The consultant is paid $25 per hour and the NDOT employee is paid $15.

Pay is the key issue, but they are bound by state laws.

Last year they said that they hired 260 construction CE/CI consultants versus 240 total in-house staff - due to a huge increase in project funding.

They are doing a lot more contractor QC and testing.

Employees can go to a consultant & work 6 months & make the same pay as a technician does in a full year.

Last year there was such a program increase that they got many inexperienced people from inspection services firms.

NDOT retirees are going to consultants now which has helped the experience level.

Also can't attract COOPS now.

DOT is a training facility for consultants.

Morale, benefits & wages are the issues.

Have 22 design openings that they haven't been able to fill (not for lack of trying) which represents 30% vacancy/turn over rate. Design is working lots of overtime. A big part of keeping morale up is "don't give them all RRR projects".

Construction : If the program increases they would have to hire consultants. Politics.

Timing and workload are factors in distribution in or out of house.
Have volunteers for many projects (design has first choice of projects).
Other factors on going out are if the need is immediate and if it is in a speciality area. Usually goes to an RFP if it is a specialty.

Construction Inspection Services: Use is based on manpower needs. Construction (Resident Engineer) makes the decision on whether to use contract inspectors on a job.

The state in-house overhead rate is 152%.

Design cost for RRR projects normally runs 4-6 % and for RRRR it is 10%, which includes the functional areas.

Design and construction training of consultants makes the cost of consultants more expensive. The state said that they don't like to train their consultants.

The competition of costs is going up at the same time the quality of inspection from consultants is going down.

Legal review: They have streamlined the legal review requirement by using "boiler plate"contracts.

QUALITY : Both in-house and consultants are required to use the same State drafting standards, CADD standards, and Quality Check-lists.

State in-house designs are the best, consultants are next, and the other agencies worst..

In-house: Do in-squad checking of designs. In PS&E have a checking section but is done late in the process. Drafting person also reviews plans. Use a uniform design format.

Consultant: Must have checks at each stage. Must meet department standards for drafting and checking format. PM's do an overview check also. Also go through the checking squad.

Constructability:
Focus on construction review at the 20-30% design phase. Consultants use experienced contractors. Sometimes they use an independent contractor team.

NDOT - Construction Division does a review and the Resident Engineer (RE) & Assistant RE

review in the design phase at early stages depending on the project. This was implemented in the last two years. Review times are at the 30-60-90% period for both in-house & out-house. Give consultants a lot of QA hours in the agreement to review and catch mistakes.

States used their Errors and Omissions clause only once.

Perception is that in-house is better than consultant designs. Are moving to QC/QA.

Consultants often are under the gun, and often don't incorporate the change they were given. There are problems with designs managed by others also.

They emphasized QC/QA. Hours per sheet. Date, hours, checked by etc.

Retainage - 10% once at 90% - 100% until acceptance.

Variation in Quantity: A change occurs at 25% above or below the estimated quantity, or if the item is > $50,000 and a major item.

Projects also have a 3% Contingency.

QA Section in Construction: The QA section oversees both NDOT and consultants. They have independent assurance people in the field to check the quality of testing among other things. They also perform contract administration checks throughout the project.

A NDOT RE construction crew can handle $15-25 million/year depending on the proximity of the projects. A crew consists of 12.

RE is over the project, but may have a couple of assistants that may manage projects.

Staff feels that there are fewer quality checks now. Also they feel that quality drops when the program increases. The quality of people is lower, so they can't accomplish as much.

They feel that they will be able to tell in the next 4 to 5 years or so if the quality did suffer, because the signs will begin to surface.

Need to have a training process on policies, procedures, etc., for consultants if they are going to be successful.

Employees feel that another key is to select in-house projects that will provide the most expertise for developmental purposes. They should not be given to consultants. Design and construction should keep the most challenging work in order to attract and retain the best people. Give them jobs that they want to come to

State Responses to Questionnaire - Nevada

Q - Question ***A - Answer***

Q 1 What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for preconstruction engineering services (road design, bridge design, right-of-way engineering, right-of-way acquisition, right-of-way appraisals, bridge inspection, traffic engineering, geotechnical surveys, materials investigations, wetlands studies, archaeological /biological, landscape design, environmental, corridor studies, photogrammetry, feasibility studies, field surveys, hydraulics and research)?

A 1 Expenditures for consultants (pre-construction engineering): FY 97 - 5.9%; FY 98 - 5.7%; FY 99 - 7.3%.

Q 2: What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for construction engineering services (management, inspections, materials testing)?

A 2 Expenditures for consultants (construction engineering for calendar year): CY 97 - 12.7%; CY 98 - 11.1%; CY 99 - 9.9%

Q 3 Why does your department use consultants?

A 3 The Nevada Department of Transportation (NDOT) uses consultants because there is insufficient staff in-house to handle the work load in a timely manner. NDOT also uses Consultants when the services needed are beyond the expertise of our in-house staff.

Q 4: What was your Construction Program level in dollars for FY 97, FY 98, and FY 99?

A 4 Construction Program funding: CY 97 - $18,570,188; CY 98 - $22,743,204; CY 99 - $28,827,065

Q 5: If your annual construction budget increases, would you hire more consultants, more in-house staff, or both? Why?

A 5 NDOT would hire additional consultants if the budget was increased. This is do to the fact that it is extremely difficult to increase in-house staff at this time

Q 6 Is maintaining in-house technical expertise important?

A 6 Yes. In-house expertise is vital to provide necessary oversight to determine that the end product meets both federal and state standards. To this end, NDOT has conducted an Engineer-In-Training (EIT) to enhance the level of in-house technical expertise as well as providing various specialized classes on an "as needed" basis.

Q 7 What types of consultant contracts do you use and what approximate percentage are they of the total number of consultant contracts annually for FY 97, FY 98, and FY 99? .

A 7 NDOT uses consultants in disciplines including but not limited to: architecture, construction (both full administration and augmentation), DBE supportive services, environmental services, freeway and non-freeway design, geographic information systems, geotechnical engineering, government auditing, location, materials sampling and testing, multi-modal transportation planning, public outreach, right of way engineering,

structural design, studies of intelligent transportation systems, traffic engineering and value engineering. NDOT does not track individual types of consultant agreement disciplines in the database. Therefore percentages for such are unavailable.

Q 8 Does your Department have an errors and omission policy? (Yes/No) Please explain why.

A 8 Yes. NDOTs error and omissions policy is contained in the consultant agreement. Basically, the consultant is held responsible for errors and omissions which occur during the pre-construction design phase. These errors and omissions are to be corrected by the consultant at no additional cost to NDOT. However, there is no requirement for the consultant to have error and omissions insurance. The rationale for this policy is to hold the consultant accountable for significant errors and omissions which impact constructability.

Q 9 Please describe your experience, if any, with reimbursement from consultants who have committed errors or omissions.

A 9 In 1996, a bridge was designed for a portion of the I580/US395 extension south of Reno, NV in which one of the columns was positioned incorrectly. This error was not discovered until construction started on the project. The consultant completed a re-design of the column at his own expense and construction was completed. This is the only incident in recent history where the NDOT errors and omissions policy was used.

Q 10 How do you use in-house staff to procure consultants?

A 10 In-house staffs prepare all announcements and/or Requests For Proposal (RFP) to obtain consultant services. Two separate committees are established to review all proposals and conduct oral interviews to select the best-qualified consultant for a particular project. Final approval of each consultant rests with the Director of NDOT.

Q 11: How do you use in-house staff to manage consultant contracts?

A 11 NDOT has an Agreement Services Section. This section of four people is responsible for the preparation of all announcements and/or Requests For Proposal (RFP) to obtain consultant services. It is responsible for the receipt of all proposals and initial review to ensure all RFP requirements have been met. It also handles various consultant-related correspondence. Additionally, the section manages the consultant pre-qualification and insurance verification programs. The section receives and tracks all consultant invoices and prepares required fiscal documents to ensure prompt payment. It also performs various data entry functions that support reporting processes. Pms manage the day to day operations of the Consultants.

Q 12: Does your Department retain any portion of payments until consultant contracts are successfully completed? (Yes/No) A 12 Yes

Q 12a If yes, what percent is withheld and over what stages of completion does this apply?

A 12a 10% is withheld after reaching 90% of allocated funds for a given project.

Q 12b Is any interest paid on the retained amounts to the consultants?

A 12b No

Q 13 What methods do you use to monitor consultant progress between major milestones?

A 13 Each project manager is responsible for monitoring his/her project which will include meetings, over the shoulder reviews and formal reviews at 30%, 60% and 90% plan submittal time. Additionally, monthly invoices are reviewed by the project manager prior to submission to Agreement Services for payment

Q 14: How do you determine in-house costs when making comparisons to consultant costs for doing the same work?

A 14 In-house costs are primarily derived from salary and fringe benefits figures only. However, the decision whether to do the work in-house or to use a consultant is determined primarily by the time when the work is required to be completed

Q 15 Are training costs included in your cost comparisons of consultants vs. in-house resources? (Yes/No)

A 15 No

Q 16 Does your Department have training programs for in-house staff who provide oversight/management of consultants? (Yes/No) If yes, please describe.

A 16 Yes. Agreement Services, in conjunction with the Audit and Legal Divisions conducts periodic training on agreement procedures. Additionally, NDOT provides various courses for Department personnel on an as needed basis. Subject matter for such courses is determined based on individual and/or Division needs.

New Mexico
Interview Summary

On (date) 5/25/00 the FLH Bench Marking Study Team consisting of representatives Howe Crockett, Rick West & Ed Calderon met in Santa Fe, New Mexico to meet with representatives of the State Department of Transportation.

ATTENDEES

• Robert Roybal	Construction Bureau	505-827-3269
• George Herrera	Preliminary Design Bureau	505-827-5270
• Joe J. Sanchez	Consultant Management Unit	505-827-5321

We met for a three hours period, reviewing the purpose of the meeting, making introductions, briefly explaining how Federal Lands operates and then how the State Department of Transportation delivers their design and construction program – touching on both in-house and out sourcing issues.

REFERENCE MATERIALS

- Organization Chart

- Full Size Plans - Minimum Checklist - Consultant (Verifications Checklists)
- Full Size Plans - Minimum Checklist - Consultant (Verifications Checklists)
- Consultant Performance Evaluation
- New Mexico State Highway and Transportation Dept. - RFP for Prof. Svcs.
- Request for Proposals for Professional Services - Construction Management

OVERALL FACTS

- Contracted work has recently reached 55% due to a bond initiative, but has typically been about 24%.
- Consultant design projects range between $5 and $15 million in Construction Value while in-house projects range from $1 - $10 million in Construction Value.
- PE on contracted designs is between 7-10% of construction cost.
- The state has contracted for construction management and inspection services for 10 plus years.
- CE cost for in-house construction management is 6-7% while it is 9-10% for consultant construction management services.
- If a consultant has a project from design through construction, the state has seen a 5% increase in the cost of PE & CE compared to in-house designs and CE.

CHALLENGES

- The legislature effectively limits the number of Full Time Employees (FTE's) by approving budgets for all State Agencies.
- Technical expertise is being lost and there appears to be no plan to maintain it.
- A greater salary can be obtained in consultant work, especially for construction technicians.
- NMSHTD construction personnel must often train higher paid consultant staff which creates dissension.
- The construction section feels they can perform construction management and inspection more cheaply than if contracted out.
- In-house designs are sometimes perceived better than consultant work.
- Consultants often don't adhere to formatting standards, plans and specifications don't match, and plans contain too many conflicting notes.
- The state does not have the resources available to develop projects in-house that involve extensive public involvement or specialty issues.
- NMSHTD personnel perform only review and oversight activities.
- Inexperienced people learn through On-the-job training and Training Seminars.
- There is no independent estimating group now, and employees feel the estimates are not as good as they once were (Internal Design and External Design estimate origins).

HIGHLIGHTED PRACTICES

- The Preliminary Design Bureau, where most support positions are located, has oversight of consultant environmental, drainage, traffic, location survey, ROW, and mapping work and provides internal design support.
- The Internal Design Bureau handles internal design, bridge, and PS&E. PS&E contains

Contracts, Specifications, and AD & Award.

- Design teams contain a District representative and Construction Liaison Engineer.
- The contracting out decision is based on resource availability and complexity of the project. Consultants have the more difficult jobs with intense public involvement and specialty work.
- Several projects are packaged into one RFP.
- Design work done by Districts consist primarily of rehabilitation projects.
- For the RFP process. Pre-proposal meetings are usually held within 10 days after issuing the RFP. Resulting amendments are issued within 3 days.
- A committee, consisting of members of the Engineering Division, the Districts, and technical experts, select the winning firm. The Professional Services Selection Committee is established by a Rule in the New Mexico Statutes.
- Design contracts are negotiated lump sum by phase. Payment of the lump sum is based on % progress in that phase which results in a partial payment for services rendered until services are accumulated to reflect 100 % complete for that phase.

- Primavera is being implemented for in-house and consultants.
- A 5% retainage is held for each phase until the phase is complete and all deliverables for that phase have been accepted by the NMSHTD as complete.
- On projects where time is important or user costs are higher than usual, the state uses a dis-incentive clause to penalize a consultant if they do not provide the product on time.
- Try to recoup administrative costs for quantity busts.
- A design consultant is required to have an in-house quality control program. A checklist maybe used by the PDE's to review the plan work.
- Project Development Engineers (PDE's) hold monthly issue meetings and monthly administrative/status meetings.
- Performance evaluation forms are used for each design phase.
- The construction section uses consultants to provide both full construction management and inspection services and to augment state crews. Projects fully staffed with consultants are remote or isolated.
- The state's solicitation package for construction management and inspection services is based on a compilation of practices developed in state and borrowed from other states.
- Design firms are allowed to propose on construction management contracts.
- Consultant material's technicians must be certified by the joint state/industry administered program.
- The state has implemented a two week construction project manager's training session that is open to consultants for a fee.
- The state uses an 18 month rotational training procedure for a young engineer hired directly out of a university.

Compilation of Interview Notes - New Mexico

New Mexico Department of Transportation Interview May 25, 2000, Santa Fe

STIP is a 6 year plan. Those involved are Planning, the Districts, MPO's, and RPO's.

Design: There are approximately 150 active contracts. They advertised, selected, awarded, negotiated, and signed agreements for 45 contracts last year.

Preliminary Design Bureau: (They do consultant oversight of Alignment Studies, Design, Environmental, drainage, traffic, location, ROW and mapping). In the organizational chart this Bureau contains most support areas also. Internal Design Bureau handles internal design, bridge, and PS&E - specifications.

PS&E consists of - Contracts, Specifications, and Ad and Award. (They don't have an estimating group in project development now and they feel that estimates aren't as good as they once were.)PE on contracted out designs is approximately 7-10% of construction cost.

Contract Administration is a separate group that handles the receipt of proposals and keeps the contract documents for all department areas. NMSHTD requires that prospective proposers request a proposal package in order to avoid unnecessary expenses related to excess mailout of RFPs. NMSHTD only sends RFP's to Consulting Firms who request them in writing by submitting the RFP Request Form. The NMSHTD does mail out to all Consulting firms registered with the Contracts Administration Section a copy of the Legal advertisement with the attached RFP Request Form.

They package several projects in one RFP. The consultant can propose on selected projects within the RFP Package. They put out about 9 RFP's (June - April). There are about 200 consultants on their pre-qualified list in the state.

There is a legal advertisement and prospective consultants request the package. A pre proposal meeting is usually held depending on the complexity of the project. Get 5-15 proposals each.

RFP: They hold pre-proposal meetings approximately 10 days after they issue the RFP. Have 3 days for amendments from this meeting.

A Committee usually selects the firm. Each Voting Committee member rates each proposal on criteria established for A/E Contractors. The criteria is in the procurement code (NM) and FHWA requirements. (The committee members are the Engineering Division, the District Representatives, and technical experts). (The Professional Services Selection Committee is established by a Rule in the New Mexico Statutes.

If it is a complicated RFP, after the proposals are rated using the specific requirements for the procurement code, a shortlist of consulting firms is invited to interview. The Interview questions use a rating criteria (abilities and qualifications) and targeted questions specific to the project..

Negotiations: Design contracts are negotiated phase by phase (lump sum - lump sum is paid based on partial payment & percent complete by phase)) which allows flexibility. Study Phase, Preliminary Design Phase, and Final Design - Each will have subphases. They audit projects that are over $250,000.

O.H. Rates: Vary from 86% of direct labor costs to 175%. Use a bundled O.H. rate. Include G & A on labor subs. Negotiate out G.A. on direct expenses. Try to negotiate upper limit at 160 - 170%.

They are now using more on-call piecemeal contracts. They have tried some piecemeal designs and other piecemeal type contracts such as for subsurface utility work. The on-call services are usually general in scope (general in engineering, general in surveying, etc). This allows for the flexibility to react quickly to design emergencies or prioritized design.

By legislation a design contract is limited to 4 years.

Consultant Side (Preliminary Design Bureau): 10 Project Development Engineers (PDE).

Internal (Internal Design Bureau): 10 Project Development Engineers (PDE's), each with a design group.

In-house does more 3-R projects, etc. Each District has a design group. Districts mostly design rehabilitation projects such as 3-R overlays.

PDE's have about 10-15 projects at various stages.
PDE's typically have 10 years experience.

They are implementing Primavera for in-house and consultants.

PDE's develop estimates for STIP. They have monthly meetings for big issues. They have an administration meeting monthly for overall project status.

On the consultant side the projects range from $5 to $15 million in construction value. Two PDE's have $250 million and $100 million projects respectfully. In-house projects range from $1 million to $10 million in construction value..

The percentage of consultant work has recently reached 55% due to a new bonding initiative. Typically the program consulted out has been about 24%.

Construction Field Staff: NMDOT consists of 6 Districts with a total of 300 people. The 300 includes technicians, District Lab, and audit personnel also. Each District also has 6 liaison engineers.

Construction Contracting Out: They been using inspection services for 10-12 years. Last year there were 5 firms and 80 people working for consultants on state construction projects.

The CE cost for in-house construction management ranges from 6-7% as percentage of construction cost. It ranges from 9-10% if these services are contracted out.

Augmentation of state forces on construction projects: They have at least one State person and

augment with contract inspectors. The Augmentation Program trains the consultants and then they are ready to staff the stand alone projects

Wholly Staffed Projects: Also they wholly staff projects with consultant services. These are usually the stand alone projects that are very remote or isolated from other projects.

* A design firm can also propose on construction management contracts. This has been done on one project. Prior to this the Attorney General wouldn't allow it.

Construction Management contracts are limited to 4 years duration.

If the program were to grow, they would have to hire consultants. The legislature limits the number of FTEs by approving budgets for all state agencies. This effectively controls the hiring of new people. NMSHTD does not lose too many employees to consultants, but some do leave for larger salaries with consultants. For instance, technicians are leaving and getting the same wages as state engineers. There are not too many employees close to retirement which are the ones attractive to consultants.

Skills: The DOT uses personnel for review and oversight. They do not have the resources for extensive public involvement. Have lost many people through retirement so there is little experience. Initiation by fire is normal.

Morale: Morale issues relate to pay disparity. Construction Technicians are the ones that can make much more out of house.

Designers: Top out at about $20/hour now. Consultants pay $28 to $30 per hour but may not have a benefits package comparable to the State.

Construction: Employees resent the contract technicians. Contract employees make more money but the NMSHTD person often must train them or carry more of the load. Also some DOT employees resent working with former DOT employees.

NMSHTD states that they keep the design of some of the more difficult projects for developmental purposes, but this does not appear to be widespread or policy considering the decision criteria for contracting out projects. Other than the training indicated, there does not appear to be a plan to maintain expertise.

If a project is given to a consultant from the beginning through construction, NMSHTD has seen a 5% increase in cost of PE & CE compared to in-house designs and CE.

Decision to contract out: The head of the Preliminary Design Bureau (consultant section) and representatives from other Internal Bureaus decide what to contract out. The decision is based on resource availability and complexity. Some projects are kept for developmental purposes.

Consultants usually have the more difficult designs, containing specialty work and public involvement issues. Lack of DOT resources is another factor in contracting out designs.

Decision Basis:
Construction projects staffed wholly with consultant services: Look at staff levels and availability throughout the state. If they don't have the resources to move to a particular project then it becomes eligible to be staffed solely with consultant employees. The program is volatile, so they can't identify projects ahead of time. They have 5 pre-qualified on-call consultants now and may go to 10. Normally, they prefer not to do such stand alone projects.

Construction staff have asked to develop a stand alone program of projects, but this has been resisted by management due to the higher cost to the state.

Construction: Feels they can accomplish project management and inspection more cheaply in - house than contracting it to a construction management firm.

They train consultants in construction management. Technicians must be certified through the Transportation Technician Certification Program, which is a joint effort of the DOT and the Association of Contractors of New Mexico.

Construction is trying to develop a more extensive training program. Now a new employee learns in the field. They are trying to develop a career ladder.

Currently, young engineers hired directly out of college go through an 18 month rotation in different departments. Design and Construction assignments are 6 weeks each and hydraulics is for 2 weeks.
NMSHTD has a training branch and managers work with employees in this area, but employees must be proactive to obtain the desired training.

NMSHTD plans to hire an engineer to train prospective engineers. They refer to this endeavor as the Engineer Boot Camp. This is a 2 week intensive training for construction PM's and is available to consultants for a fee.

Design: The NMSHTD uses a dis-incentive clause to penalize the consultant if they do not get the product out on time. They try to recoup administrative costs for quantity busts.

NMSHTD uses a performance evaluation form at every phase of the design process.

Retainage: Hold 5% by phase and usually release it when they receive the deliverable.

Errors and Omissions: Depends on State Statute. Firms will usually negotiate out a settlement because they want more work.

Construction has had few problems with errors and omissions, but they feel they need to keep the consultant designers on through construction due to potential issues, but currently it is optional.

Quality Control: NMSHTD used to have a verifications group which was used for plan quality review but now the consultant does the quality checks and they must have their own QC program.

The NMSHTD has milestones throughout the design process. PDE's can use a sheet by sheet verifications checklist. About half use it. An independent check by a consultant is an option a prime consultant can use.

This check may be performed by another section of the consultant's office.

Construction's perception is that consultant designs are not the same quality as in-house designs.

Constructability: The Construction Liaison Engineer may do a review. Don't have a program for this, but do it on some projects. Don't do it early enough in the design process.

Design Teams include a District representative and Construction Liaison Engineers who attend all design meetings.

The lack of uniformity or consistency in the plan formatting is a problem for construction. Consultants often don't adhere to formatting standards. Also the plans and specifications often don't match.

The consultant plans are bombarded with notes and extra information that make the plans inconsistent with NMSHTD PS&Es requirements.

The general feeling in Construction is that consultants don't address comments well, but this often depends on the firm.

Construction Management QC and Oversight: The District Construction Engineer has oversight of projects run by consultants. A District Project Manager or Resident Engineer under the District Engineer will also have oversight. As stated earlier, CE contracts are limited to 4 years by statute. Construction Liaison Engineers (6 total) also review the work and the independent assurance personnel check materials testing and quality.

Consultants may also attend the Engineer's Boot Camp, that is being developed for NMSHTD employees, but will be required to pay. Consultants will also be trained in the construction tracking system, Site Manager.

State Responses to Questionnaire - New Mexico

Q - Question ***A - Answer***

Q 1: What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for preconstruction engineering services (road design, bridge design, right-of-way engineering, right-of-way acquisition, right-of-way appraisals, bridge inspection, traffic engineering, geotechnical surveys, materials investigations, wetlands studies, archaeological /biological, landscape design, environmental, corridor studies, photogrammetry, feasibility studies, field surveys, hydraulics and research)?

A 1 FY 97 total budget $ 305,008,200.00
preconstruction engineering percentage - 6.58%

FY 98 total budget $ 374,200,000.00
preconstruction engineering percentage - 4.8%

FY 99 total budget $ 313,536, 200.00
preconstruction engineering percentage - 18.1%(*)
(*) increase caused by major bonding program

Q 2: What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for construction engineering services (management, inspections, materials testing)?

A 2 FY 97 total budget $ 305,008,200.00
construction engineering percentage - 0.43%

FY 98 total budget $ 374,200,000.00
construction engineering percentage - 1.39%

FY 99 total budget $ 313,536,200.00
construction engineering percentage - 2.23%

Q 3 Why does your department use consultants?

A 3 The NMSHTD utilizes consultants due to limitations in staff availability, the occasional need for special skills, or the relative urgency of projects. Additionally, to ensure a balanced workload, an orderly consultant selection process, and a sufficiently large volume of work to attract and keep qualified consultants in the State, some consideration is given to how much and what kind of work should be done by consultants.

Q 4: What was your Construction Program level in dollars for FY 97, FY 98, and FY 99?

A 4 FY 97/98 Construction Program $ 295,000,000.00
FY 98/99 Construction Program $ 273,000,000.00
FY 99/2000 Construction Program $ 510,000,000.00

Q 5: If your annual construction budget increases, would you hire more consultants, more in-house staff, or both? Why?

A 5 In order to meet the needs of the traveling public in New Mexico, the NMSHTD would probably hire more consulting firms. The reason this probably would occur is that the NMSHTD Operating budgeting has not increased.

Q 6 Is maintaining in-house technical expertise important?

A 6 Yes, the Department attempts to keep in-house staff working on projects which are challenging from the standpoint of design complexity, environmental documentation and challenging from the Public Involvement standpoint. We rely on in-house staff to provide oversight and limited review of consultant work. Technical expertise for the Department is maintained through challenging projects and in-house or contracted technical training seminars.

Q 7 What types of consultant contracts do you use and what approximate percentage are they of the total number of consultant contracts annually for FY 97, FY 98, and FY 99?

A 7 The department utilizes consulting engineering contracts for preliminary engineering, final design, environmental/archaeology services, hazardous materials investigations, photogrammetry services, surveying services, geotechnical engineering services, bridge design services, subsurface utility engineering and coordinating services, value engineering, and drainage engineering services. The total number of contracts signed in FY 97, 98, and 99 were 57, 35, and 47 respectively. Preliminary and Final Design contracts account for approximately 90% of the budget.

Q 8 Does your Department have an errors and omission policy? (Yes/No) Please explain why.

A 8 Yes, we utilize an Errors & Omissions (E&O) requirement for consulting engineering services. The E&O requirement for consultants is used to protect against an engineering design error or design omission. Much like in private industry, the Department takes the position of the owner, and as such likes to protect the interests of its investors - our New Mexico Traveling Public.

Q 9 Please describe your experience, if any, with reimbursement from consultants who have committed errors or omissions.

A 9 The Department has had occasion to request design and construction corrections which were due to errors or omissions of the consultant. Design corrections add cost to a project. This process can take a fair amount of time to identify levels of responsibility. However, Consultants, for the most part, have been cooperative and accountable. This has allowed the Department and the Consulting firms involved to negotiate a fair settlement.

Q 10 How do you use in-house staff to procure consultants?

A 10 A Consultant Management Unit is detailed to accomplish the procurement and funding process and contract monitoring required by the New Mexico Procurement Codes and FHWA.

Q 11: How do you use in-house staff to manage consultant contracts?

A 11 The Consultant Management Unit(CMU) operates within the Preliminary Design Bureau and under Project Development/Consultant Section. Management of consultant contracts is accomplished by responsibilities tasked to the Unit and direct and open communication to the CMU's in-house clients and direct communication to the CMU's out-of-house clients.

Q 12: Does your Department retain any portion of payments until consultant contracts are successfully completed? (Yes/No)

A 12 Yes

Q 12a If yes, what percent is withheld and over what stages of completion does this apply?

A 12a 5 percent by phase completion.

Q 12b Is any interest paid on the retained amounts to the consultants?

A 12b No

Q 13 What methods do you use to monitor consultant progress between major milestones?

A 13 The CMU in conjunction with the project manager reviews progress payments(project % complete) prior to authorizing payment. The direct involvement of the project manager assures first hand knowledge of the on-going work and completed services of a consultant. Additionally, payment approvals are forwarded up the chain of command through the Project Development/Consultant Section Head for final approval by the Preliminary Design Bureau Chief.

Q 14: How do you determine in-house costs when making comparisons to consultant costs for doing the same work?

A 14 In-house costs VS. Consultant costs are compared by man-hours required to complete the requested services. In-house staff with expertise in specific project tasks review man-hours prior to a cost negotiation with a consultant.

Q 15 Are training costs included in your cost comparisons of consultants vs. in-house resources? (Yes/No)

A 15 NO

Q 16 Does your Department have training programs for in-house staff who provide oversight/management of consultants? (Yes/No) If yes, please describe.

A 16 Yes. Management seminars coupled with technical training seminars. Additionally, due to the dynamic nature of project development, information is readily shared and passed around the Preliminary Design Bureau. Information sharing creates new avenues for on-the-job training.

Oregon
Interview Summary

On 5/24/00 the FLH Bench Marking Study Team consisting of representatives Howe Crockett, Rick West, Ed Calderon, & Dan Alexander met in Salem, Oregon to meet with representatives of the Oregon Department of Transportation.

ATTENDEES

• Kyle Knoll	Purchasing/ Contract Mgmt.	503-986-2966
• Bobbi Mathews	Purchasing/ Contract Mgmt.	503-986-2709
• Chris Myers	Contract Coordinator - Roadway	503-986-3753
• Michael Long	Mgr. - Geo/Hydro Section	503-986-3374
• Kevin Boyle	Region 2 Local Programs	503-986-3374
• Ken Stoneman	State Const.& Mtls Engineer	503-986-3023

We met for a three hours period, reviewing the purpose of the meeting, making introductions, briefly explaining how Federal Lands operates and then how the State DOT

delivers their design and construction program – touching on both in-house and out sourcing issues.

REFERENCE MATERIALS

- Organization Chart
- Draft - Recommendations for Developing a Consultant Strategy

OVERALL FACTS

- Oregon considers their core businesses to be maintenance, projects, and motor carriers.
- Contracting is done both "piecemeal" and "total project."
- 80 - 90% of local agency projects are done by consultants.
- There is no limit on consultant profit.
- Cost is 2 ½ - 3 times higher for contracted work.
- Specialized work is contracted out.
- ODOT is exploring the use of AE to perform design through construction oversight on state projects.

CHALLENGES

- Since there is no limit on profit, the Project Team Leader must "battle" over agreement.
- Currently the state must use AE firms, only, for construction management and inspection which costs the state more than a General Services type of contract.
- The legislature has placed a cap on hiring and must be consulted during session in order to vary staff size.
- The state has lost many experienced people to consultants and other effects. A 20-30% difference in pay by consultants is a significant factor, as well as politics, frustration, and the retirement system's gains.
- Employees are dissatisfied that "work is going out the door" and feel that they are forced to accept sub-standard consultant work.
- Funding is totally from the gas tax.

HIGHLIGHTED PRACTICES

- ODOT has developed a decision matrix that may be used to determine which projects are contracted out and to retain desirable projects in-house. This decision tree allows them to defend actions during legislative inquiries.
- Technical Services Resource Managers (TSRM) and the Resource Leveling Team (RLT) meet monthly for a 3 month project snapshot to determine staffing needs.
- Technical Services is responsible for design, but each Region's Project Team Leaders (PTL) develop scope, budget, and schedules and work with local agencies.
- Oversight of consultants is provided by the PTL and Technical Services staff. The contract manager has insufficient time for oversight due to work overload.
- ODOT oversight personnel provide informal training for consultants to "do it the state way."
- Both consultant performance and construction contractor evaluations are performed.

- ARTIMUS scheduling software, customized for ODOT, is used by Project Team Leaders.
- A Project Manager assumes responsibility after the PS&E goes to construction.
- Project Team Leaders act only as advisors through construction.
- PTL stays with local agency projects through construction.
- A 3.5% contingency is added to the contract amount to compensate for changes orders.
- Working toward forecasting resources out 2 years on a moving 3 month window using a spreadsheet as a tracking tool.
- They employ retainage language, but do not use it.
- ODOT pays a 5% differential for Engineers that stamp products.
- Try to keep challenging work in-house to use for staff development and retention.
- Assist employees to become registered engineers and to retain registration through continuing education.

Compilation of Interview Notes - Oregon

Oregon Department of Transportation Interview May 24, 2000, Salem

Core Business: Maintenance, Projects, Motor Carriers.

Consultants are used either "Piecemeal" or "total project"

They use Cost Plus Fixed Fee for most of their contracts with a Not To Exceed threshold.

Design/Build Contracts: Have done a couple design/build (DB) projects, but have not decided if this is an area that should be pursued.

Project Flow: Last 10 years - flexible services from $15 million to $59 million with $35 million awarded.

Technical Services Resource Managers (TSRM) and the Resource Leveling Team (RLT) meet monthly for a 3 month project snapshot to see what staffing needs are.
May use Flexible Services Contracts to get piecemeal help as needed. *(See page 22 of the ODOT draft document - "Recommendations for Developing a Consulting Strategy")*

*They use a decision matrix for contracting out *(See page 23 of the ODOT draft document - "Recommendations for Developing a Consulting Strategy")*

Technical Services is responsible for design but Region's Project Team Leaders (PTL) are responsible for scope, budget, schedules for projects, and to work with the local agencies. All Engineers are under one structure, (Technical Services), but not all are located in Salem.*(See page 15 of the ODOT draft document - "Recommendations for Developing a Consulting Strategy")*

Project budgets are based on internal resources, not AE costs.

Internal OH:
ODOT 33-35% loaded rate for internal. Don't consider building maintenance, lights, etc.

ODOT uses 70% for budgeting. (1.7 multiplier for benefits for estimating purposes) Does not include lights, etc.

There is no limit on profit, so the PTL usually battles over it. The consultants can go elsewhere for work.

Design contracts are now fixed price, not to exceed a certain price, and are paid by the task. They also use hourly billing with a not to exceed amount.

Project load carried by Project Team Leaders:
Depends on skill and type of project in their area, etc. Same pay for all despite their project load. There are 35 Project Team Leaders statewide located in the 5 Regions with at least 5 PTL's per Region. PTL's typically have7 to 15 projects at various stages at any time and the average size is about $5 million. Project size ranges from $200K to $35M.

Local projects are $400 thousand to $700 thousand.

The Project Leader acts ONLY as an advisor through construction.

A Project Manager takes over after PS&E goes to construction.

Tools: ODOT spreadsheet (ARTIMIS - AMS real time, like Microsoft Project (templates are customized by ODOT and Utilized by PTLs.)

Local Agency Projects: Manager stays with the project through construction.

Construction builds in a 3 ½ % contingency for change orders into the contract amount.

Project over runs are about 3% due to extra quantities, modifications, etc.

Contracting Out:

Specialized work is out-sourced.

There are no legislated target levels yet for contracting out, but the legislature does question ODOT about how much is contracted out. Consultants may perform various functions anywhere from survey through contract administration, but this is more prevalent on local agency projects.

Cost: 2.5 - 3 times higher cost for contracted work. 300% wages and OH and 9-11% profit (270% average rate)

Construction Inspection Services:
They use inspectors and general help for construction engineering and construction inspection

(CE/CI) services however, they use AE hired firms which have a very high OH rate as opposed to General Services type of contracting. They stated, their legal help did not support this General Services type of contract they felt this was in violation of the temporary services statute

Local Agency Work:
ODOT has a Flexible Services Contract available for use by the locals. They must use an ODOT/FHWA approved process.

Consultants perform everything from design through construction.

They are looking for AE to do design through construction oversight for their state jobs.

80 to 90% of the local agency projects are done by consultants.

How to choose which projects go to consultants:

Complex, no in-house expertise, and many unknowns. Have a decision tree. Internally driven, because want to keep a good work force, so keep some good projects in-house. This process allows them to explain to the legislature why they haven't contracted out certain projects.

The *ODOT draft document - "Recommendations for Developing a Consulting Strategy"* is a new tool that has not been fully implemented and evaluated yet. However, during the interview they did state that all of the concepts had been taken from real life examples.

Concerning the matrix mentioned in the *ODOT draft document - "Recommendations for Developing a Consulting Strategy"* - The higher the score the greater likelihood the project will be kept in-house. The lower the score, the better the chances the design goes to consultants.

They don't use the matrix *(See page 23 of the ODOT draft document - "Recommendations for Developing a Consulting Strategy")* on every job, but it is a decision tool. They rank and then look at the resources that are available.

Resources:
Working on forecasting resources out 2 years on a moving 3 month window. Use a spreadsheet to track resources and determine deficits, etc.

Use AMS Scheduling Software, customized for ODOT, that sets milestones, etc. Tools: ODOT spread sheet (ARTIMIS - AMS real time, Like Microsoft Project (templates are customized by ODOT and Utilized by PTLs.)

The legislature has placed a cap on hiring and must be consulted (every two years) in order to vary core staff size. Funding is based on gas tax only. Regions often ask for an individual to work on a project and causes friction if they don't get them. If the program increases they would probably have to utilize consultants.

Morale:

The best ODOT people are leaving for consultant jobs because:
1) $ 20-30% pay hike
2) Politics
3) Frustrated
4) Retired because of PERS (public employees retirement system) rate. (More benefits if they leave now versus risking changes in the future)

Employees don't like it that the work is going out the door.
They feel that consultant's products are not up to standards, but must accept their work because of time constraints. This is a bad message to employees.

Pay 5% differentials for the Engineer that stamps products. Do an analysis. Have management by budget. Lobby activities for increased FTE. This is due to a demonstration of recruitment problems.

Don't have incentives for contract specialists.

Maintaining Technical Expertise/Employee Development:

They try to keep challenging work in-house to use for staff development and retention. A big job is $35 to $40 million, such as the 217 Interchange.

They assist employees in becoming registered engineers and help retain the registration with continuing education. They provide training materials that can be checked out by the employee. They are also considering allowing study time. ODOT pays for review courses.

Oversight:
Oversight is conducted by the Project Leader and Technical Services employees.
The Contract manager does not have enough time to oversee due to paperwork overload.

ODOT utilizes a consultant performance process and construction evaluation also.

Retainage: Have language in the agreement, but don't use.

Errors and Omissions:
They had only one case where a consultant paid ($13,000) for errors and omissions.

ODOT Construction staff prefer ODOT designs. There are both good and bad consultant designs.

Q.A.:PTL's must seek out someone with the expertise to review design phase or aspect. There does not appear to be a standard procedure for review of plans. Proposals give a rundown of internal QA procedures. There are no ODOT guidelines for Q.A. There is a 3 volume contract design manual, but consultants don't follow it well.
Uniformity of plans is a problem.

There is no official training program for consultants, but in essence ODOT does provide training for the local agency work performed by consultants.

The ODOT oversight person provides informal training for consultants to "do it the state way."

There is no construction review of consultant designs. If an ODOT employee will be the construction Project Manager, then that person will see plans during earlier stages.

Local Agency Work:
ODOT liaison is to provide oversight but is stretched too thin to perform this function properly.

Local governments do not generally understand ODOT requirements.

Locals - the various departments do a review.

State Responses to Questionnaire - Oregon

Q - Question ***A - Answer***

Q 1: What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for preconstruction engineering services (road design, bridge design, right-of-way engineering, right-of-way acquisition, right-of-way appraisals, bridge inspection, traffic engineering, geotechnical surveys, materials investigations, wetlands studies, archaeological /biological, landscape design, environmental, corridor studies, photogrammetry, feasibility studies, field surveys, hydraulics and research)?

A 1 FY97: Records not currently accessible.
FY98: 45.3%
FY99: 38.5%

The data / percentages are based on *Professional Services Contracts* information for the FY98 and FY99 ***Commission Reports*** ...

- FY98 Budget: $ 38,385,211.00
  - PE: $ 17,392,594.00
  - CE: $ 3,699,118.00

- FY99 Budget: $ 49,321,534.15
  - PE: $ 18,975,282.00
  - CE: $ 2,147,048.23

Q 2: What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for construction engineering services (management, inspections, materials testing)?

A 2 FY97: Records not currently accessible.
FY98: 9.6%
FY99: 4.5%

Q 3 Why does your department use consultants?

A 3 There is common agreement that there is not enough in-house staff to provide the project delivery services needed to meet project schedules. Consultants also provide expertise that is not readily available with current department staff. By using consultants:

It enables ODOT to adopt an optimal staffing strategy for delivery of projects in a workload cycle of periodic peaks and valleys. Consultants can be used to augment any voids in technical skill during peak demand periods.

It enables ODOT to sustain a timely delivery of projects when faced with a temporary influx of work that exceeds expectations.

It enables ODOT to be responsive to work demands that may be beyond the current expertise of staff.

It enables ODOT flexibility to shift staff resources or expertise internally or geographically by bringing in consultants to fill short-term voids.

It enables ODOT to augment project resources for an entire project covering many disciplines, or for a specific discipline for an extended period of time, or for a specific discipline.

Q 4: What was your Construction Program level in dollars for FY 97, FY 98, and FY 99?

A 4

	Number	Award Amount
FY 97, 10/96-9/97	147	$293,768,219.56
FY 98, 10/97-9-98	174	$356,490,461.56
FY 99, 10/98-9/99	148	$287,409,726.27

Q 5: If your annual construction budget increases, would you hire more consultants, more in-house staff, or both? Why?

A 5 For short-term construction budget fluctuations such as bonding measures to provide revenue for specific projects, additional consulting staff and temporary in-house staff would be increased. This gives the department resource flexibility to reduce its workforce after peak demand without affecting permanent Staff. If the long-term construction budget were to be increased by statutory or congressional action, additional permanent in-house staff would be added to accommodate the workload, however, some increase in consultant usage would also be considered to compensate for peak workload demands caused by weather, or specific projects.

Q 6 Is maintaining in-house technical expertise important?

A 6 The Department uses a weighted decision matrix to assist in consulting project selection that takes into account if the project is considered to be challenging and motivational. If so, these are more likely to remain in-house in order to provide quality-training experiences for our workforce.

Q 7 What types of consultant contracts do you use and what approximate percentage are they of

the total number of consultant contracts annually for FY 97, FY 98, and FY 99? .

A 7

	FY97 (*)	FY98	FY99
Arch./Eng.		2.7%	7.3%
Arch./Landscape		.6%	
Construction Eng.		9.6%	4.5%
Data Processing		14.5%	21.9%
Environmental		3.2%	
Financial/Accounting		.1%	
Human Resource/Trng.		.5%	.55%
Planning		10.7%	14.5%
Preliminary Eng.		45.3%	38.5%
Program Coordination		.2%	.05%
Research/Studies		8%	2.6%
Right of Way		.3%	
Other		4.3%	10.1%

*Records not currently accessible

*Records not currently accessible

Q 8 Does your Department have an errors and omission policy? (Yes/No) Please explain why.

A 8 The Department requires contractors to obtain and provide evidence of professional liability insurance, which covers errors and omissions. The standard dollar level of coverage is $1,000,000.00, but may be reduced or increased based on the risk involved. Support Services consults with the Department of Administrative Services (DAS) / Risk Management as warranted to determine the appropriate level of coverage needed to protect the State's interests.

Q 9 Please describe your experience, if any, with reimbursement from consultants who have committed errors or omissions.

A 9 Current records don't indicate a recent occurrence of contractor reimbursement for errors or omissions; additional time would be needed to more fully research this issue.

Q 10 How do you use in-house staff to procure consultants?

A 10 Staffs that are subject matter technical experts are assigned to write the technical specifications in Requests for Proposals, Qualifications, and technical language in the contract structure. They also serve on technical review teams and contract award selection committees.

Q 11: How do you use in-house staff to manage consultant contracts?

A 11 Technical staff is used to write scopes of work in contract work orders, as oversight and review experts on progress and quality of submittals of prime or sub contractors, and to evaluate the overall performance of the consultants.

Q 12: Does your Department retain any portion of payments until consultant contracts are

successfully completed? (Yes/No)

A 12 The Department, in the Personal Services contract, reserves the right to withhold 5% of the total contract amount until all required work is completed and accepted by the Department.

Q 12a If yes, what percent is withheld and over what stages of completion does this apply?

A 12a As mentioned above, the Department reserves the right to withhold 5% of the total contract amount. There are no specifics / standard guidelines over what stages of completion … i.e., the Contract Administrator can do this on a deliverable, monthly or overall basis..

Q 12b Is any interest paid on the retained amounts to the consultants?

A 12b The Department does not pay contractors interest on amounts retained

Q 13 What methods do you use to monitor consultant progress between major milestones?

A 13
* Monthly invoices are received from consultants.
- Payment is requested based on actual use of consultant services (billable hours and expenses)
- Technical contract administration staff reviews invoices.
- % Consultant services used are compared to % project (milestone) completed. Significant deviations are questioned and resolved.
- Occasionally technical contract administration staff will visit consultant on-site to review progress.
- Have required weekly or monthly progress reports for firms that are not as strong in regular status communications.

Q 14: How do you determine in-house costs when making comparisons to consultant costs for doing the same work?

A 14 In-house personnel costs (calculated at the loaded rate – includes vacation, sick leave and insurance benefits) are compared to total Consultant costs.

Q 15 Are training costs included in your cost comparisons of consultants vs. in-house resources? (Yes/No)

A 15 **N/A**

Q 16 Does your Department have training programs for in-house staff who provide oversight/management of consultants? (Yes/No) If yes, please describe.

A 16 Yes. The Support Services Division provides training to all contract administrators and managers. The training provides essential information for quality contract administration/management. A detailed on-line Personal/Professional Service Contracting Training manual is available through the ODOT Intranet. for continual use. http://intranet.odot.state.or.us/ssb/pcms/Procedures/Manual.doc

Tennessee
Interview Summary

On 5/18/00, the FLH Bench Marking Study Team, consisting of representatives Calderon and West, met in Nashville, Tennessee, to meet with representatives of the Tennessee Department of Transportation.

ATTENDEES:

• Gerald Gregory	Director of Maintenance	615-741-2027
• Mike Shinn	Chief of Administration	615-741-5376
• Chris Christianson	Director of Project Management	615-741-7929
• Jeff Jones	Director of the Design Division	615-741-2221
• Dale Smith	Contracts	615-741-5027
• Ron Carter	Senior Assistant to Commissioner	615-741-5616
• Alan Little	Finance	615-741-2261
• Jim Boggess	Finance.	615-741-8987

We met for a three hour period; reviewing the purpose of the meeting, making introductions, briefly explaining how Federal Lands operates, and then how the Tennessee Department of Transportation delivers their design and construction program, touching on both in-house and out sourcing issues.

REFERENCE MATERIAL

- Organization chart

OVERALL FACTS:

- The size of the program from 1997 to 1999, was between 700 to 800 million Statewide.
- The size of the workforce is shrinking due to legislated downsizing.
- The Department's policy is not to staff to highest point and to use consultants to fill gaps in resources and for projects ~~requiring~~ specialized areas of expertise.
- Contracting Out Levels are __% of PE and __% of Construction.
- Tennessee has a $1.4 billion program of which $25 million goes to consultant work.
- Core competencies are road and bridges design.

CHALLENGES

- The Department discussed problems with the workload on in-house staff, with the loss of expertise due to an aging workforce, and with their ability to compete for staff with private entities.
- Increased outsourcing has resulted in consultants competing with each other and the State for experienced staff, thus driving up the salary for experienced personnel and leaving the state

with the least experienced personnel in some areas.
- The workforce is aging.
- Maintaining technical expertise in order to keep consultant cost down.

HIGHLIGHTED PRACTICES

- Tennessee DOT has a single year budget/program.
- Functional areas decide which portions of the job will be outsourced and how it will be managed (in-house or outsourced).
- Twelve of their project managers are at the same or higher level as the rest of the cross-functional team.
- Funding is by function and not by overall project.
- A ten day Project Manager's training course.

Compilation of Interview Notes - Tennessee

Tennessee Department of Transportation, Contracting Out Interview, May 18, 2000, Nashville, Tennessee

Notes on Project Management:
They currently have 12 project managers.
Plan to add four additional Project Managers this year.
TDOT has a 10 day Project Manager training course
Project Managers lead cross-functional teams
Project Managers and teams develop and project schedule
Project Managers are at the same or higher level as the rest of the team

1.4 billion program
35Mil expenditures go to consultants.

Majority of structural work is done in-house to maintain tech. expertise.

CORE competencies: Road and Bridge Design

Structures have higher grade and higher number of registered PEs than Hwy Dsgn, However, working to increase the levels of Hwy Dsgn.

A PE is required for many of the structural engineering positions.

They try to do as much as they can with their in-house staff.

They have single year budget/program.

Funding is by function not by project.

They don't have authority to increase staff. The Governor does not allow for any growth. 264 positions lost last year by legislation.

They say that their in-house people are overload and timing of project delivery is first priority.

Projects selected to go to consultants and are not based on the scope of workout based on the scheduling needs of the project.

Project Managers use Microsoft Project for scheduling their projects. They are planning to use Primavera in the future.

They are not using local agencies . They are thinking about passing on some work to the larger cities and counties.

They have an in-house training called the Tennessee Trans. System Program. They also use NHI course.

Training is primarily for in-house only, although seats have occasionally been offered to consultants.

They spend 1 million to train 4,700 employees.

Proj. Dev. Team develops the schedule for projects assigned to the Project Management Office. . Functions contract out their work. "They are only 1.5 years into this process."

Procurement of consultants. 3 people - 1 clerk, database mgr. and a technical person from one of their functional branch member selects COTRs.

Pre-qualification list is good for 2 years. It is incumbent on the consultants to renew their standing.

For consultants, between 5 and 50 projects are advertised at one time (covers All functional areas).

The list of interested consultants responding to the advertisement goes to chief of engineering. (usually 60-80 AE firms). Short list to 10 firms. Then ask for additional info on form 200. And then the final short list of three firms goes to the Commissioner. His selection is based on his judgement.

It is the division's responsibility to ensure oversight quality of the design project. Poor performance by the consultant leads to no future contracts.

They don't use consultants to manage other consultations.

Twelve % PE is the goal/limit.

For the most part, the contract is open until the construction is completed.

They hold a 2 % retainage on all functions.
This is the break down of their maintenance program:
$150.2 million to maintenance *(includes routine and contract maintenance in FY 99-00)
(*Includes the cost of Cumberland Gap Tunnel)
$13 million to both services and Dsgn contract (comes from 150.2 maintenance budget.
80 million to resurfacing overlay
30.7 million to bridge repair

Construction inspection is done by consultants on a very limited basis (10 or fewer projects the past few years when TDOT needed expertise in a specific area not available in-house).

In-house does final survey check on construction quantity, looking to eliminate this effort in the future - (duplication of effort without quality).

They have been contracting out for 25-28 years.

Last 2 -3 years contracting out has taken off.
Work force is getting old and leaving. 35-40% is eligible to retirement.

They take work back from the consultants if the consultants are performing poorly.

Managing good consultants is a refreshing change, but managing bad consultants is a drag on employee's morale.

No effort to retain - pay gap between in-house and out sourced. Looking at a new performance recognition system

They have 300 employees in the survey and design division spread out to the districts.

They said that they need to maintain the technical expertise in-house or the cost to contract out is going to sky rocket - their will be no internal failsafes and the consultants are going to pillage the state and charge exorbitant fees.

They have 12 project managers who are at a level higher or the same as the rest of the cross functional team.

Project Managers are scattered out among the districts.

They perform VE in the design process on construction projects over 25 million which are on the NHS.

South Carolina do a lot of design built projects.

Design-Built may be the answer to liability however, can't think of any other real benefit to do a design-built project.
How do you monitor progress? Invoices....and monthly status comes from the invoices also.

They have 10 day training for Project Managers.

The project development team develops the schedule. The functional areas decide which portions of the job is contracted out and how it will be managed....either in-house or contracted out.

State Responses to Questionnaire - Tennessee

Q - Question ***A - Answer***

Q 1: What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for preconstruction engineering services (road design, bridge design, right-of-way engineering, right-of-way acquisition, right-of-way appraisals, bridge inspection, traffic engineering, geotechnical surveys, materials investigations, wetlands studies, archaeological /biological, landscape design, environmental, corridor studies, photogrammetry, feasibility studies, field surveys, hydraulics and research)?

	Consultants	In House
A 1	FY 97 2.74 %	1.44% | of (annual Program)
	FY 98 2.33 %	1.40% | of (annual Program)
	FY 99 2.65 %	1.22% | of (annual Program)

Q 2: What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for construction engineering services (management, inspections, materials testing)?

A 2:	Consultants	In House
	FY 97 .2022 %	6.15% | of (annual Program)
	FY 98 .3712 %	5.89% | of (annual Program)
	FY 99 .2390 %	5.27% | of (annual Program)

Q 3 Why does your department use consultants?

A 3 Due to specialized projects, the need for expertise which the Department does not have requires us to seek assistance outside the Department. Also, the Department's policy is not to staff for the highest point in our program which leaves gaps in the program in which consultants can fill because of their availability.

Q 4: What was your Construction Program level in dollars for FY 97, FY 98, and FY 99?

A 4 FY 97 $701,023,000
FY 98 $711,961,000
FY 99 $796,140,000

Q 5: If your annual construction budget increases, would you hire more consultants, more in-house staff, or both? Why?

A 5 The Department has an on-going road program approved and adopted by the Legislature. Each year certain phases of each project, i.e., preliminary engineering, right-of-way, construction, etc., are budgeted for implementation. The Department reviews this work program and determines if in-house staff is available in sufficient numbers to perform the work and to meet the required schedules. If in-house staff is not available, then engineering firms are procured in accordance with approved procedures to perform the work.

This road program has been expanding since its beginning in 1986, and it has been the Department's policy not to staff for the highest point in the program, but instead to make work available for consultants at the peak levels of this program. This program is currently in its highest levels of obligation and the Department is not able to process this volume of project work without outside assistance.

Q 6 Is maintaining in-house technical expertise important?

A 6 Yes, not only is maintaining in-house technical expertise important, but *improving* technical skills is desirable as well. The TDOT Training Office conducts an annual needs assessment to determine what improvement areas should be targeted regarding training skills. A written survey format combined with individual interviews of directors and managers is used to determine these training needs.

If the TDOT Training Staff is aware of any new technology or technical programs to be delivered in the near future, we share that information with TDOT directors and managers. By sharing this information, we are able to plan for future training needs.

Q 7 What types of consultant contracts do you use and what approximate percentage are they of the total number of consultant contracts annually for FY 97, FY 98, and FY 99? .

A 7

Types of Consultant Contracts	**1997**		**1998**		**1999**
Survey Engineering	$14,222,746	44.64%	$13,089,747	44.10%	1999
Design Engineering	4,997,181	15.69%	4,732,111	15.94%	16.93%
Construction Engineering	1,251,407	3.93%	2,810,387	9.47%	3.03%
Studies by Local Government Planning Comm	0	0.00%	14,009	0.05%	0.56%
Other studies (i.e. feasibility & needs studies)	2,923,572	9.18%	2,036,420	6.86%	9.41%
Bridge inventory and inspection	3,040,579	9.54%	2,714,744	9.15%	5.85%
Traffic Engineering	40,574	0.13%	0	0.00%	0.00%
Environmental Impact Studies	0	0.00%	0	0.00%	0.00%
Testing Services (bridge structural steel testing, etc.)	938,245	2.94%	1,274,496	4.29%	5.25%
Architectural	0	0.00%	0	0.00%	0.00%
Consulting Services (Right-of-Way)	1,576,748	4.95%	615,870	2.08%	2.25%
Closing agents and title company services	252,192	0.79%	195,925	0.66%	0.88%
Appraiser and witness services in conjunction with condemnation	2,615,787	8.21%	2,195,527	7.40%	5.96%
	31,859,031	1	29,679,236	1	1

* - Percentages based on dollars

IN HOUSE		
Survey and Design	$15,620,000	$15,403,200
Construction Engineering	$66,585,100	$64,788,300

Please note that the calculations made for the "IN HOUSE" dollars are our best estimates.

Appraiser and witness services in conjunction with condemnation	8.21%	7.40%	5.96%

* - Percentages based on dollars

Q 8 Does your Department have an errors and omission policy? (Yes/No) Please explain why.

A 8 Yes, to hold the Engineer responsible for the quality of the Engineer's work and its conformance with all applicable laws, rules, regulations and orders governing the work. The Engineer, being an independent contractor, agrees to maintain errors and omissions insurance in such an amount and form as are acceptable to the State.

Q 9 Please describe your experience, if any, with reimbursement from consultants who have committed errors or omissions.

A 9 No experience in this area.

Q 10 How do you use in-house staff to procure consultants?

A 10 In-house staff is used in all phases of the procurement process. From preparation of newspaper advertisement to consultant responses of letters of interests to the short-listing of consultants based on their past history (evaluations). A selection committee consisting of the Chief, Assistant Chief Engineer and the functional Director of the Division being evaluated arrive at a short list of 10 firms. From this list the 10 firms are asked to submit "project-specific" information for further evaluation from which the list is narrowed to 3. These 3 are submitted to the Commissioner for the final selection.

Q 11: How do you use in-house staff to manage consultant contracts?

A 11 Project managers are assigned to each consultant project. They are responsible for tracking consultant progress through progress reports submitted with monthly invoices, frequent phone contact and field reviews conducted at certain milestones.

Q 12: Does your Department retain any portion of payments until consultant contracts are successfully completed? (Yes/No)

A 12 Yes.

Q 13 What methods do you use to monitor consultant progress between major milestones?

A 13 It is the responsibility of the project managers to monitor consultant progress by means of progress reports (charts, narratives, field reviews) and showing the relationship of percentage of work completed vs. percentage of money expended. Certain milestones are generally established at the beginning of the project that illustrate approximate percentage of work completed. At preliminary/ROW/ construction field reviews (PS&E) it can be determined if the consultant is on the proper pace to complete the work on schedule and within budget. It is the consultant's responsibility not to overrun the ceiling or proceed past the established limit without first being authorized to do so by the State. Failure to comply can and often does result in the State's refusal to pay for unauthorized services.

Q 14: How do you determine in-house costs when making comparisons to consultant costs for doing the same work?

A 14 In-house costs include all direct costs plus labor. (No indirect costs are included.)

Q 15 Are training costs included in your cost comparisons of consultants vs. in-house resources? (Yes/No)

A 15 No.

Q 16 Does your Department have training programs for in-house staff who provide oversight/management of consultants? (Yes/No) If yes, please describe.

A 16 No.

-END -

Executive Summary

Robert Greenleaf once quipped, "many attempts to communicate are nullified by saying too much." This philosophy has been adopted in the development of this report. The Contracting Out - Bench Marking Study Group has worked very hard in a short amount of time to provide accurate and timely data to support the Executive Quality Council's effort to collect data and report on the (1) the status of FLH current activities, (2) information on State/consultant activities, and (3) best practices identified during our effort.

With regard to the information on State/consultant activities, the team made an initial recommendation to the EQC which was approved with a few modification resulting in a final list of 14 State Departments of Transportation. Concurrently, the team developed a list of 16 questions and submitted to the states for response. Of the 14 states, we received 12 responses and visited 11 of them to discuss their responses and to establish a rapport for future bench marking efforts. Due to scheduling conflict, Illinois was not available to meet with us during the range of dates available.

It should be noted that the focus of this data collection effort centers around the following six factors specifically articulated by the Federal Lands Highway, Executive Quality Council. They are as follows.

- Level of Contracting Out - Identify what Preliminary Engineering and Construction Engineering functions are contracted out and compare to overall PE and CE budgets. Also compare engineering costs to overall construction program budget.
- Critical Mass - Identify the optimum number of personnel required to deliver internal and outsourced work. Identify staff mix, structure, and processes needed to optimize work output.
- Maintain Technical Expertise - Identify how an organization maintains Technical Expertise when they may be doing more contract oversight than technical work. How does an organization make decisions on which disciplines to maintain Technical Expertise in?
- Cost Effectiveness - Identify whether cost is an important factor in deciding whether or not to contract work out? Identify methods or processes organizations use to control, evaluate, and monitor costs.
- Training and Development - Identify the internal training an organization uses to educate their workforce when contracting out is a significant portion of their work.
- Other Factors (Quality, Liability, Efficiencies) - Identify efficiencies and methods used to ensure quality products and services, and to ensure contractor accountability.

Acknowledgments

Sign on executive's desk: "I know you believe you understood what you think I said, but I'm not sure you realize that what you heard is not what I meant to say."

It is so very difficult to properly communicate in this dynamic age. So a hearty thank you must be offered up to the Federal Lands Highway Executive Quality Council for their continued support and patience.

Each visit to a different State Department of Transportation or State Highway Agency or District Office was a challenge and a great opportunity. Many thanks to the numerous individuals that helped us collect the data we needed. In all cases our group was warmly received. Your openness and willingness to help is a tribute to your success.

From the Team Leader,

When the van pulled into the only remaining vacant campsite, everyone jumped out and began to work at a feverish pace. After completely unloading the vehicle and setting up the tent, two kids rushed off to gather firewood while the other two set up the camp stove and began setting out the ingredients for dinner.

"Gee," commented a fellow at the neighboring campsite, "you sure get some teamwork out of your family. I never saw anything like it."

"I have a system," the father confided. "No one gets to go to the bathroom until camp is set up."

Many thanks to the tremendous efforts of the Contracting Out Bench Marking Study Group. They worked countless hours and performed under very difficult conditions.

Daniel S. Alexander II

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Initial data received from states

Early in the year, Art Hamilton distributed an e-mail request for information regarding the levels of contracting out experienced by the State Departments of Transportation. The following is a compilation of the information received.

State	Notes	% Contracted
Alabama	Major part of design by contract (consultants. Also using a large number of consultants for construction inspection.	
Alaska	Construction contract administration Design Projects Misc.	10% 31% 0%
Arizona	A great deal of the highway design and construction work in Arizona is being done by consultants, contractors, and others.	
California	Due to a recent State Court decision against contracting out of engineering consultants, CALTRANS is now limited to contracting out for environmental activities and speciality work only. Specialty Work = Bridge Design Specialty Work = Experimentation/research of seismic retrofit.	
Colorado	Col. DOT has been contracting out significant amounts of project development activities in recent years, including environmental studies and documents as well as plans development. They are contracting out a growing amount of construction contract administration. For their FY ending July 30 1999, contracting out 51% of design and construction oversight	51%
Connecticut	Design Projects Construction Inspection	72% 61%
Delaware	Design Services Construction Management Services	60% 60%
Georgia	Design work Currently Georgia DOT does approximately 75% of their design work in-house, This is about to change rapidly due to funding increase in TEA-21 and losing personnel in retirement, GDOT will transition to more consultant design work. They have recently announced the formation of a new office to manage the consultant design work.	25%

State	Notes	% Contracted
Idaho	Design Projects	67%
	Construction Management	10%
Illinois	Illinois DOT expects to triple its consultant budget this year from $55 mi/year to $160 mil/year. Most of this is for Environmental and Design purposes. There will likely be an increase in construction engineering contract this year as well.	
Indiana	Environment studies	90%
	Design Projects	90%
	Construction Oversight	10%
	Maintenance	
	ITS area	
	All construction contracted - 6 million of force account construction	100%
Iowa	Construction Inspection	25%
	Very little is contracted in R/W.	
	Roadway design	62%
	bridge design	41%
	project planning(location and environment)	18%
Kansas	1990 - 97 Consultants did 71% of the plans and design work for the major highway and bridge jobs.	71%
	during 1998-99, the consultants did about 58% of the work	58%
	2000-09 program - consultants are schedule to do 70% of the plans and designs.	70%
	KDOT does have In-house crews that do the maintenance activities.	
	The reconstruction and major construction jobs are let to contractors.	100%
Kentucky	Professional Services - design, environmental studies, planning, underwater bridge inspection, photogrammetry...typical preliminary engineering items.	80%
	Construction	5%
note	Engineering and related services has grown from FY94 $39m to $68m in FY 99.	
Maine	Highway Design	30%
	Bridge Design	20%
	Construction Engineering	13%

State	Notes	% Contracted
Maryland	Plats	90%
	Field Surveys	33%
	Mapping	100%
	Design on a dollar basis	60%
	Design on a project basis	50%
	Construction	100%
Missouri	Highway Design	82%
	Bridge Design	16%
	Construction Inspection	0%
	Misc.	3%
Nebraska	Design engineering	35%
	Construction engineering	0%
Nevada	Most of the very large and very expensive projects are designed by consultants. NDOT will keep one or two bid projects a year in-house to keep their experience level up.	
New Hampshire note	Design Projects In-house is for smaller contracts - the dollar amounts of work performed by consultants is much higher than the number of projects. 84M (63%) of the total $134m 1998 prog. was designed by consultants.	33%
New Jersey	Design on a project basis	95%
	Construction	30%
New Mexico	Pavement Markings	100%
	Signing	100%
	Logo Program	100%
	Construction management on certain projects	100%
	Usual design services such as environmental, design and traffic studies	40%
Note	Study on outsourcing available.	
N Dakota	State portion of the $218 total construction program was:	
	$161m of which $32 m was placed under contract for construction engineering services.	20%
	contracts for design services were issued on work that is estimated to cost $112 m when constructed.	50%
	County program was about $39m - all design and construction engineering done by consultant services.	100%

State	Notes	% Contracted
Oklahoma	Design work Construction Inspection Bridge Inspections	70% 10% 75%
Oregon	ODOT contracts out about $140m annually for all design and construction engineering services.	
Puerto Rico	The Puerto Rico Highway and Transportation Authority contracts out the majority of its preliminary engineering work including some construction management and design/build Management contracts for large transportation projects. Engineering Services	90%
Tennessee	Design Projects Construction Inspection (except for specialized work) R/W Appraisal work Environment studies	50% 100% 60% 60%
Texas	Preliminary engineering, including design construction engineering	51% 2%
Utah	UDOT currently contracts out 45% of its Design work UDOT does not contract out for construction inspection projects which are administered by UDOT.. Most local governments use consultant construction inspection services.	45% 0%
Washington	EIS Design is also often contracted The locals often contract out construction inspections.	
West VA	WVDOH does contract out for engineering services in many areas including preliminary engineering for environmental document preparation and contract plans, construction inspection, bridge inspections, materials inspection, and even some right of way services. Preliminary engineering design services Most NBIS inspection of major structures are contracted out to consultants. WVDOH has just started to use consultants for construction inspection in the last couple of years but that number is also growing. Most of the material inspection services provided by consultants, are set up as a statewide contract for special services. Increase in the about of right of way activities contracted out to consultants.	75% 10%

State	Notes	% Contracted
Wisconsin	consultant program is close to 50% of our deliverables. This includes both design and construction engineering services.	50%
Wyoming	15% of total design engineering (PE) $ are contracted out 1% of total construction engineering (CE) $ are contracted out 20% of total planning $ are contracted out.	15% 1% 20%

Letter of Transmittal

Analysis of the levels of contracting out provided a basis for selection of potential State Departments of Transportation for further study. The Executive Quality Council approved a list of 16 states including Florida, Connecticut, Tennessee, Maryland, Nevada, Oregon, New Mexico, Arizona, Kansas, Kentucky, Indiana, Illinois, Colorado and Delaware. A questionnaire and letter of transmittal were developed and forwarded to the 14 State Departments of Transportation.

U.S. Department
of Transportation

Federal Highway Administration

400 Seventh St., S.W.
Washington, D.C. 20590

Earlier this year, I sent an e-mail to (name) Federal Highway Administration Division Administrator in your State, informing him of the Federal Lands Highway Core Business Unit's desire and intention to conduct a bench marking study on contracting out. With your help, we are off to a great start. Thank you!

We are now moving into the data collection phase and would appreciate your hosting a visit from our bench marking study team sometime during the weeks of May 15 through May 26, 2000. The focus of our visit will be to meet with you and your staff to learn from your experiences with contracting out. We are especially interested in learning how you manage your consultants while maintaining an adequate level of internal expertise.

To help facilitate this effort, please respond at your earliest convenience with the name, phone number, and e-mail address of a point of contact from your office so a member of my staff can begin the process of making the necessary arrangements.

To assist in preparing for our visit, we have compiled the enclosed list of questions for you to complete. If at all possible, please provide your responses electronically to our study team leader, Mr. Dan Alexander of my staff, by April 28, 2000, at the following e-mail address: daniel.alexander@fhwa.dot.gov.

If you have any questions, please contact Mr. Alexander at 202-366-9482. Thank you for your assistance in our study.

Sincerely yours,

Arthur E. Hamilton, P.E. Program Manager, Federal Lands Highway

Enclosure

Federal Lands Highway - Contracting Out Study Questionnaire

Question 1: What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for preconstruction engineering services *(road design, bridge design, right-of-way engineering, right-of-way acquisition, right-of-way appraisals, bridge inspection, traffic engineering, geotechnical surveys, materials investigations, wetlands studies, archaeological/biological, landscape design, environmental, corridor studies, photogrammetry, feasibility studies, field surveys)*?

Question 2: What percentage of your annual budgets was expended for consultants for FY 97, FY 98, and FY 99 for construction engineering services (*management, inspections, materials testing)*?

Question 3: Why does your Department use consultants?

Question 4: What was your Construction Program level in dollars for FY 97, FY 98, and FY 99?

Question 5: If your annual construction budget increases, would you hire more consultants, more in-house staff, or both? Why?

Question 6: Is maintaining in-house technical expertise important? If so, what methods do you use to ensure adequate levels of expertise?

Question 7: What types of consultant contracts do you use and what approximate percentage are they of the total number of consultant contracts annually for FY 97, FY 98, & FY 99?

Question 8: Does your Department have an errors and omission policy (yes/no)? Please explain why.

Question 9: Please describe your experience, if any, with reimbursement from consultants who have committed errors or omissions.

Question 10: How do you use in-house staff to procure consultants?

Question 11: How do you use in-house staff to manage consultant contracts?

Question 12: (a) Does your Department retain any portion of payments until consultant contracts are successfully completed (yes/no)?
(b) If yes, what percent is withheld and over what stages of completion does this apply?
(c) Is any interest paid on the retained amounts to the consultants?

Question 13: What methods do you use to monitor consultant progress between major milestones?

Question 14: How do you determine in-house costs when making comparisons to consultant costs for doing the same work?

Question 15: Are training costs included in your cost comparisons of consultants vs. in-house resources (yes/no)?

Question 16: Does your Department have training programs for in-house staff who provide oversight/management of consultants (yes/no)? If yes, please describe.