

**DOT Response to  
DOA Analysis of DOT Engineering Cost Analysis  
11/19/04**

**Summary of DOT Response to DOA Analysis**

1. DOA does not provide any specific, valid criticism of the DOT engineering cost comparison methodology, data or results.
2. The vast majority of the DOA report addresses data - including average hourly wages and FTE costs - that is not used in DOT's engineering cost comparison study. DOA creates its own FTE and hourly cost comparison methodologies each of which is not valid as an overall cost comparison. Nor is the data they use and calculate accurate for an FTE or hourly cost comparison.
3. The DOA analysis does not provide any reliable information or analysis indicating that DOT employees or state highway project work costs more per hour.
4. DOA vastly overestimates the cost of DOT FTE's by double counting a large portion of their salary and then multiplying that by an overhead rate that creates an error of approximately \$45,000 or 43% of the estimated cost.

**These issues are dealt with in detail below.**

**DOA's Analysis of DOT's Engineering Cost Analysis**

The DOT engineering cost comparison study calculates that DOT engineering services are 18% lower than consultant engineering services for state highway improvement projects from FY1999 to FY2002. This 18% is calculated using a private sector type overhead methodology.

The one place DOA analyzes the DOT engineering cost comparison methodology is on page 4 of their analysis under the section titled Allocation of Project Time. Key points made in this section by DOA and DOT's response follow:

**DOA Analysis:** It is unclear how the department determines which projects will be assigned to consultants.

**DOT Response:** As part of the cost comparison study, DOT reviewed the distribution of work between in-house staff and consultants. The data showed the division of work between in-house staff and consultants appears to be comparable and does not favor in-house results.

**DOA Analysis:** The DOT's method for allocating shared time is not described and results in a significant portion of the sample being excluded from the analysis.

**DOT Response:** DOT has a very clear databased method for determining what projects are considered DOT led, consultant led and shared. Actual charges with DOT overhead applied are used to calculate whether 60% to 100% of total charges are made by DOT or by consultants to specific projects. Projects are considered led by DOT or consultants when that party is responsible for 60%

or more of the total charges. All projects identified as in-house led or consultant led are included in the cost comparison calculations. When the amount both parties charges is less than 60% (in the 40% to 60% range), the project is considered a shared project and not sufficiently led by one party to hold it responsible for the overall project costs. Shared projects are not included in the cost comparison and potential savings from shared projects are not claimed in the study conclusion. Shared projects are 8.8% of design project contract amounts and 12.2% of construction project contract amounts.

## **Additional Comments on Analysis and Data Not Directly Related to DOT's Engineering Cost Comparison Study**

**Most of the DOA analysis focuses on data that is not used in the engineering cost analysis.** DOA creates its own FTE and hourly cost comparison methodologies each of which is not valid as an overall cost comparison. Nor is the data DOA uses and calculates accurate for an FTE or hourly cost comparison. In some cases their assumptions and data are dramatically inaccurate.

Additional information was given to DOA to illustrate the effects of an 18% difference in cost – not to do cost comparison calculations. The cost comparison methodology uses a DOT engineering services overhead rate that was developed so a public/private sector comparison can be made. This cost comparison includes both variable and fixed costs for DOT. It is not a calculation of the variable costs that are actually affected by hiring more or less state employees.

The following are DOT's response to many of the more significant inaccuracies in the DOA report.

### **DOT Study**

**DOA Analysis:** The \$27.6 million amount was generated by “the cost of an FTE in state employment” and “the relative workload of a consultant versus a permanent employee in the highway improvement program.”

**DOT Response:** In this statement, DOA seems to misunderstand how the DOT comparison is calculated although they later correctly cite how the \$27.6 was calculated. Estimated FTE costs and relative workload are not used in the engineering cost comparison analysis. The \$27.6 million was calculated by applying the 18% difference in the cost of engineering services for producing state highway contract work. The cost of engineering services is the amount actually charged to a project with DOT overhead applied.

### **Per FTE Position Cost Measure**

**DOA Analysis:** DOA states: “In an effort to make a more direct comparison to consultants, the department factored out time devoted to training, leave time, etc., by reducing annual hours by 30 percent to 1450 to reflect the cost of time dedicated to highway projects.”

**DOT Response:** This is not accurate. The DOT cost comparison does not use these FTE assumptions. It uses the most reliable information available - actual cost data for projects - to compare the cost of DOT and consultant engineering services to deliver highway projects.

Project costs are driven by many factors. Hourly wages are one major factor. The number of hours worked is another major factor. DOT has not done a study to compare these two factors or other factors that determine total cost. DOT does not have a record of actual hours worked, average hourly wages and overall FTE costs for all consultant projects. In any case, FTE costs or average hourly wages do not provide valid overall project cost comparisons as DOT's engineering cost comparison does.

**DOA Analysis: State FTE's cost \$148,720.**

**DOT Response:** The methodology DOA uses to calculate the cost of a DOT FTE is seriously flawed. DOA overestimates the cost of a DOT FTE by approximately \$45,000 or 43%. DOA double counts the staff costs included in DOT overhead (indirect labor and time off with pay) and then multiplies that error by the overhead rate as shown below:

**DOT's overhead methodology accounts for indirect hours and time off with pay in the overhead.** They are part of the \$104,000 estimated cost of an FTE.

Accurate FTE Cost Estimate by DOT:

	1450 hours/FTE
x \$	22 hourly salary
	\$ 31,900
+	\$ 71,775 indirect cost (\$31,900 x 2.25 overhead rate)
	\$103,675 Cost of an FTE

Inaccurate FTE Cost Estimate by DOA:

	2080 hours/FTE
x \$	22 hourly salary
	\$ 45,760
+	\$102,960 indirect cost (\$45,760 x 2.25 overhead rate)
	\$148,720 Cost of an FTE

The \$45,000 additional cost that DOA attributes to state workers results in the following overestimate of an average hourly cost:

<u>\$148,720 Cost of a state FTE engineer</u>	=	\$102.56 hourly cost
1450 hours of direct project work		

Below is a more accurate estimated hourly rate including DOT overhead:

## Hourly Rate Estimate

	<u>Employee</u>
Wages	\$22.00 (FY04 projected)
DOT Tier 1* Overhead @200.66%	44.15
Consultant Overhead	N/A
DOT Tier 2** Overhead @24.78%	5.45
Profit	<u>N/A</u>
Total	\$71.60

\*Tier 1 overhead represents indirect costs that are only allocated to engineering services performed by DOT employees.

\*\*Tier 2 overhead represents general & administrative indirect costs that are allocated over all engineering services including both DOT and consultant staff.

**An Hourly Cost Comparison Is Not An Overall Project Cost Comparison.**

The DOA analysis uses average hourly costs of an employee as their cost comparison methodology. DOA's methodology is not a valid comparison of overall project costs. Hourly employee costs are only one variable in project costs. Hours of direct labor and overhead are other major variables that affect project cost.

**Neither DOT nor DOA Have a Reliable Hourly Cost Comparison Method.**

Any cost comparison should be done methodically using the best available comparable data. DOA's methodology does not clearly define data characteristics to make sure the data is comparable or reliable. Data characteristics that should be considered include: time period, projects included, types of consultant work included, reliability of data, and types of employee charges. DOT Tier 2 overhead should be applied to consultant salaries for any hourly cost comparison also.

The \$22 per hour wage estimate used by DOA for an employee average hourly wage was a "working estimate" for FY04 used by the DTD Division Office before FY04 data was available. It should not have been used by DOA as FY03 comparison data.

**Relative Work Load Measure**

**DOA Analysis:** DOA refers to the "project cost for permanent employee versus consultant workload."

**DOT Response:** The engineering cost comparison includes LTE employee costs as well as permanent employee costs.

**DOA Analysis:** The DOA analysis refers to shared work as "that which cannot be allocated completely to one or the other."

**DOT Response:** It would be accurate to say that “shared” projects are not part of the cost comparison because neither DOT nor consultants have done 60% or more of the work. This is explained in more detail above.

**DOA Analysis:** The DOA analysis states: “The department’s savings estimate does not incorporate the cost of a permanent employee, as calculated above.”

**DOT Response:** DOA’s calculations are incorrect. The full cost of all employees’ work is included in the engineering cost comparison data. This is explained in more detail above.

### **Analysis**

**DOA Analysis:** DOA states that DOT’s methodology assumes that the cost of a consultant is comparable to the cost of a permanent employee after factoring out time spent outside of project work.

**DOT Response:** This is not true. The DOT analysis does not compare the cost of a consultant employee with a permanent employee. The goal of the DOT analysis is to compare the total of all engineering costs to let contract costs. Nor does DOT factor out time spent outside of project work. This time is included in the overhead rate.

**DOA Analysis:** DOA states that DOT’s methodology assumes that the project time allocated to shared work can be factored out of the workload analysis.

**DOT Response:** This statement is not accurate. Projects rather than project time are defined as “shared.” Shared projects are those where neither DOT nor consultants have charged 60% or more of the engineering services to a project. This is explained in more detail above.

### **Comparison of Costs**

**DOA Analysis:** The DOA analysis states the full cost of a state FTE position is \$148,720 and the average hourly rate is \$102.56. “...the difference in average costs is dramatic and calls into question the department’s assertion that significant savings would result from replacing contractors with permanent employees.”

**DOT Response:** DOA’s numbers are dramatically off. As explained above, the DOA cost estimate for an FTE is higher than the \$104,000 estimated by the Department because it double counts employee costs included in overhead and then applies overhead to this double counting. This results in an error of \$45,000 in additional FTE cost.

**The estimated cost of an FTE is not part of the engineering cost calculations. They were included in the information provided DOA to illustrate cost savings and to translate direct hours of work into FTE’s. This issue is dealt with in more detail above.**

## Projected Savings

**DOA Analysis:** "Using the department's determination of 18 percent efficiency savings, the recommended 50/50 split of consultants and permanent employees could yield maximum savings of only \$1.6 million annually, as compared to the department's estimate of \$6.9 million annually. However, the questions raised relative to the department's methodology in determining the efficiency of permanent employees and the department's disregard for the relative cost of consultants, it appears that annual savings would, in fact, be far less than \$1.6 million."

**DOT Response:** The inaccuracy of the points made in the last sentence have already been documented.

DOT did not estimate \$6.9 million would be saved in the coming biennium or with a 50/50 split as DOA implies. DOT stated that the cost of engineering services "might have been [\$27.6 million less] if consultant led projects had been delivered at the in-house delivery percent." This statement simply illustrates the magnitude of the cost difference.

To properly analyze the other data that DOA uses here, it should be emphasized that DOT's engineering cost comparison study was the topic for the briefing DOT gave DOA in April 2004. That study was completed before the meeting and has not been revised. Other information shared with DOA was work in progress for the Division of Transportation District's (DTD) biennial budget issue paper. DOT shared work in progress with DOA assuming more communication would occur in the future. Some of the assumptions in the final issue paper changed and the data for in-house/consultant hours was adjusted to better reflect engineering services by removing real estate hours. In the biennial budget issue paper:

- DTD adjusted the in-house goal to 55%.
- The in-house hours estimate for FY03 was adjusted downwards by approximately 2% and consultant hours were adjusted upwards by approximately 2%.

The number that DOA provides as a savings estimate - \$1.6 million - is not accurate even by their assumptions. Staffing levels for the next biennium (FY6 and FY07) should be used rather than staffing levels from a previous biennium (FY03). In addition, the assumptions for in-house staff levels and the in-house goal should be updated to be consistent with DTD's submitted biennial budget issue paper.