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Joint Committee on Finance

Paper #655

Highway Program Engineering Positions (DOT -- State Highway Program)

[LFB 2013-15 Budget Summary: Page 466, #10]

CURRENT LAW

The Department of Transportation (DOT) conducts the engineering functions of the state highway program both with engineers and various other technical services personnel who are state employees ("in-house" staff) and through contracts with private engineering firms ("consultants"). The Department manages the state highway program from the central office, in Madison, as well as through its regional offices.

Highway engineering functions can generally be divided into two categories: design engineering and construction engineering. Design engineering encompasses all the activities that occur prior to bidding, including the preparation of an environmental study, if required, development of traffic management plans, utility relocation plans, and the preparation of complete plans for bidding. Construction engineering involves monitoring the work of the construction contractor to ensure that standards and specifications of the contract are followed, and overseeing the testing of materials. The Department uses a mix of consultant engineers and in-house staff for both stages of project delivery.

GOVERNOR

Provide 180 SEG positions annually to increase the number of Department highway engineers and related technical positions. Transfer \$11,741,500 SEG in 2013-14 and \$15,655,300 SEG in 2014-15 from the state highway rehabilitation budget line for engineering consultant services to the delivery budget line for the highway improvement program to fund the salary, fringe benefit, and supplies costs associated with the new positions.

DISCUSSION POINTS

1. The bill would provide 180 positions annually of various classifications related to the engineering functions and supporting technical services involved in the highway improvement project development process. Of the 180 positions, 158 would be civil engineers, engineering specialists, or engineering technicians, while 22 would be in various specialist position classifications related to computer aided-design and drafting (CADD), real estate, and contract issues. The Department indicates that if the positions are approved, 145 would be located in regional offices, and 35 would be in the central office. In three of the five regional offices (Green Bay, Madison, and Waukesha), the Department would create a new production section, consisting of 45 positions each. A production section consists of an engineering chief, 30 civil engineers of various classifications, and 11 engineering specialists or engineering technicians, plus three technical specialists. In the other two regions (Eau Claire and Wisconsin Rapids), the Department would supplement existing production sections with an additional five positions each. Of those five, two would be civil engineers and three would be engineering specialists and technical specialists.

2. The Department's proposal would allocate 35 central office positions in its "statewide bureaus," as follows: (a) 13 in the Bureau of Structures, to develop bridge designs and provide statewide guidance on specialty areas, such as load analysis, metal fabrication, sign bridges, and retaining walls; (b) 10 in the Bureau of Project Development, for standards development, the development of performance management tools, and the development and training in the use of "3-D" design practices; (c) 10 in the Bureau of Technical Services, to provide development and guidance in various areas, including the use of lidar (the use of lasers and GPS receivers for mapping and other engineering applications), materials research, and utility issues; and (d) two in the Office of Business Opportunity Equity and Compliance, to provide coordination and oversight of the Department's compliance with state and federal labor and equal rights laws.

3. The new positions would generally perform highway engineering services that would otherwise be done by engineering consultants. Accordingly, the bill would transfer funding between budget lines within the Department's SEG appropriation for the state highway rehabilitation program to fund the costs of the new positions, so there would be no net change to the Department's budget for engineering services. Specifically, the bill would transfer \$11,741,500 SEG in 2013-14 and \$15,655,300 SEG in 2014-15 from the Department's budget for contractual services to budget lines for the salary, fringe benefits, and supplies and services in support of the positions.

4. The new positions would be located in the Department's Division of Transportation Infrastructure Development, which is responsible for managing the planning, design, and construction of state highway improvement projects, as well as several other transportation programs, including local transportation assistance programs. The Division has a total of 1,047 authorized positions that are in civil engineer and engineering-related classifications, and another 200 in technical support position classifications of the type included in the Department's proposal.

5. Of the 1,047 civil engineer and engineering-related positions, 1,001 positions are currently filled. [The number of filled positions changes as existing employees leave and new

employees are hired. The Department is currently in the process of filling vacancies.] The following table shows the distribution of these currently-filled positions by function, with the first four categories representing the areas where the new positions would be assigned.

<u>Function</u>	<u>Positions</u>
Regional Office Project Development	427.0
Regional Office Technical Services	186.5
Central Office Project Development	103.5
Statewide Bureau Technical Support	87.5
Planning and Operational Support	118.5
Maintenance Program	<u>78.0</u>
Total	1,001.0

6. As the size of the state highway program has grown in the past decade, the Department has relied increasingly on private consultants to provide engineering services. To measure the share of engineering services conducted by in-house staff versus consultants, the Department uses the direct wages paid for time spent on project work. In 2000-01, 46% of direct project wages went to in-house staff, while 54% went to consultants. By 2011-12, the percentage of in-house work had fallen to 29% (71% consultants), due to a decrease of approximately 160 engineering positions and a concurrent growth in the size of the highway program. The Department estimates that the additional positions would increase the share of in-house work to 37% (63% consultants), but this would still be below the share of work conducted by in-house staff in 2000-01.

7. In comparison to highway agencies in other Midwestern states, the Department is generally more reliant on consultants for engineering services. According to a recent survey of agencies, Wisconsin outsourced a similar share of design engineering services as Illinois, Kansas, and Kentucky (all within the 70% to 80% range), but was significantly more reliant on consultants for design engineering than Indiana, Iowa, Michigan, Minnesota, Michigan, and Ohio, which used consultants for 30% or less of design engineering work. For construction engineering, Wisconsin uses consultants for slightly over 70% of the work, while none of the other Midwestern states use consultants for more than 50% and five of those states use no consultants or rely on consultants for less than 10% of the work.

8. The Department provides two principal justifications for the additional engineering positions. First, the Department argues that additional in-house engineering staff are needed to build the Department's internal technical and policy expertise, to better manage the overall program, as well as provide effective oversight of the consultant engineering work. Second, the Department believes that increasing in-house staff engineering effort can produce cost savings, since DOT engineers can perform engineering work at a lower cost than work done through consultant engineering contracts. These arguments are discussed in separate sections below. [Although not all of the positions in the Department's proposal would be engineers, in the discussion below, the term "engineer" or "engineering services" is used as a shorthand to refer to the positions or functions that would be provided, unless otherwise indicated.]

Technical Expertise and Oversight

9. The Department argues that certain key functions cannot be done by consultants, because of either legal restrictions or practical reasons. The follow list shows some functions that DOT believes must be done by state employees, categorized according to duties performed on individual projects and duties performed in support of the entire highway program.

Project-Specific Duties That Must be Done by State Employees

- a. Develop the scope concept for a project in preparation for a consultant contract (or for in-house design), including, for instance, the identification of alternatives for study, and other issues to be addressed.
- b. Review consultant qualifications, select consultant candidates, and negotiate consultant contracts.
- c. Oversee consultants, including directing the consultant's work when decisions need to be made in the course of project development, reviewing invoices, determining if the consultant is performing all contract work satisfactorily, and evaluating consultant work upon completion.
- d. Be accountable to the public for decisions on projects, including decisions on the application of engineering standards and determining when it may be acceptable to make exceptions to standards.
- e. Serve as project manager during design and construction, which involves managing project leaders and inspection staff, who may be either consultants or state staff.

Program Support Duties That Must be Done by State Employees

- a. Establish planning and programming priorities on a regional and statewide level.
- b. Provide uniform guidance, to both DOT and consultant project development personnel, on the application of best engineering practices, procedures, standards, and technologies.
- c. Review and update the Department's technical manuals and Department policies and guidance to reflect changes to laws, policies, procedures, and innovations.

10. The principal reason given by DOT that the duties outlined in the previous point must be done by state employees, rather than by consultants, relates to the need for the Department to be accountable for the expenditure of state funds and for the exercise of the powers and duties granted to the Department under state law. While consultants can execute the decisions made in the course of project development and provide guidance for use by the Department in making those decisions, the Department staff must have sufficient knowledge and expertise to be the final authority on state transportation program direction.

11. In addition to the Department's legal accountability for transportation program

decisions under state law, federal law establishes a similar requirement that the Department has a full-time employee in "responsible charge" of the transportation projects for which federal funds are used. According to federal guidance, the "responsible charge individual" must be able to maintain familiarity with the day-to-day project operations in order to monitor contract compliance, make or participate in decisions related to changing conditions or the scope of the project that may require contract change orders, and review financial transactions to ensure that safeguards are in place to prevent fraudulent practices. For most DOT projects, the designated responsible charge individual is the project manager, who oversees projects during both the design and construction phase. Typically, the project manager is responsible for as many as 20 highway rehabilitation projects at one time, in various phases of development. Individual projects are directed by project leaders, who may be state employees or consultants, but who are not given the authorities and duties of the responsible charge individual.

12. In a 2012 review of the state's transportation project development process, the Federal Highway Administration found that the Department is generally in compliance with federal responsible charge requirements for major highway development and southeast Wisconsin freeway rehabilitation megaprojects, and for the federal-aid local projects that the Department manages. With respect to other highway rehabilitation projects, however, the review found that the Department's project managers carry a "very heavy workload" and concluded that "a commitment of some additional resources is necessary to fully meet responsible charge requirements." The Department cites the responsible charge review's conclusion as one reason why additional state positions are required.

13. The Department argues that, in order for them to fulfill their duties, it is important that project managers, project development supervisors, and other supervisory and policy development staff have a range of experience in all stages of project development. Ideally, for instance, entry-level engineers are given assignments in multiple areas and on projects with varying complexity during their first several years with the Department. Those engineers who gain that type of broad experience are qualified to eventually accept additional responsibility at the regional or central office level.

14. The Department indicates that the current level of engineering staffing is not sufficient to allow the Department to provide opportunities to gain proficiency in multiple areas. Although the Department has 1,001 filled civil engineer and engineering technician positions, just 427 of these are devoted to project development in regional offices (central office project development staff duties are mostly related to the review of plans and preparation of documents for bidding). The Department estimates that, of the 427 regional staff, 168 spend greater than 60% of their time overseeing consultant work, leaving 259 who spend most of their time doing direct work on design or construction engineering.

15. As a result of staffing shortages, DOT engineers are more frequently assigned to a single stage of project development or are directed to concentrate on a single type of project. Although this avoids the temporary lost productivity associated with retraining for new tasks, it does not allow Department staff to develop the broad range of experience needed to advance to higher supervisory or administrative positions. The Department has expressed concern that as senior

supervisory engineers begin to retire, there will be an insufficient pool of in-house engineers with a broad base of experience to assume the leadership positions.

16. The Department notes the particular importance of having full project-development expertise when negotiating contracts with consultants. Consultants are selected based on a qualifications review process (as opposed to the kind of low-bid procedure used for the selection of construction contracts). Once selected, the Department and consultant firm negotiate over the terms of the contract. One of the key specifications is the mix of personnel that will be assigned to perform the various tasks under the contract. This decision is an important factor in the final amount of the contract, since it determines the cost of each unit of labor. A misallocation of skills and expertise can result in a higher contract cost than is necessary to accomplish the work. If, for instance, a particular task can be efficiently completed by an entry-level engineer, but instead the contract is negotiated to assign a more experienced engineer to that task, the cost of the contract will be higher than would be the case if an entry-level engineer were assigned to that task. The Department argues that the personnel who negotiate contracts need to have sufficient, direct experience with project development in order to ensure that the public's interest is well served in these negotiations.

17. The Department also notes the importance of having sufficient capacity to conduct project design and construction engineering with in-house staff for the enhanced bargaining position it provides when negotiating contracts. In many cases, the Department may go into contract negotiations with a contractor without having a fallback option to do the work with in-house staff if the consultant's offer is not competitive. In these cases, the Department may be forced to pay higher rates than would be the case if the consultant had to offer rates that were competitive with the in-house alternative.

18. The concerns expressed by the Department regarding insufficient in-house expertise for oversight and policy guidance have been expressed by other state transportation agencies. In a 2008 report, the U.S. Government Accountability Office (GAO) found that many states, like Wisconsin, reported an increasing reliance on private consultants for engineering services, primarily due to a lack of sufficient state staff to assume the increasing workload associated with growing highway programs. GAO reported that many states indicated that state staff are "increasingly further removed from day-to-day oversight" of projects due to the need to simultaneously oversee numerous projects, and were concerned that this "could affect their ability to adequately oversee the work of contractors and consultants over the long term."

19. The purpose of establishing complete, 45-person production units in three of the Department's five regional offices, under the Department's proposal, would be to develop in-house expertise at all stages of project development. The Department indicates that none of its regional offices currently has a complete production unit consisting of only state employees and who are only assigned to direct project work rather than consultant oversight. The other two regional offices would receive five employees to supplement existing production units, allowing for more direct project work.

20. The positions in the Department's statewide bureaus would provide both direct production work (bridge design) and central guidance for project development policies and the

dissemination of new practices and technologies. The Department notes that currently consultants provide guidance on advanced technologies, but that statewide bureau personnel need to be involved in these projects in order to develop policies and practices for use on statewide project development. The Department believes that building additional technical expertise within the statewide bureaus would facilitate a wider use of advanced technologies on all projects.

Cost Comparison of Consultant and In-House Engineering

21. The Department has conducted two types of engineering cost studies that it claims demonstrate that the use of in-house engineers to replace work done by consultants would lead to savings in the highway program. According to the results of one of these studies, an hourly rate comparison, the addition of 180 positions would generate savings of \$5.5 million on an annual basis. The other study, a delivery cost percentage comparison, estimated that the total cost of highway project delivery (design and construction engineering), as a percentage of construction cost, is 18.7% higher for consultant-led projects than for state staff-led projects. These two studies are discussed in the following points.

22. The hourly rate study involves the calculation and comparison of direct labor costs and overhead costs for both in-house staff and consultant engineers, using an hour spent directly on project work as the basis of the calculation. A more detailed description of the methodology is presented in an appendix to this paper, but the methodology is briefly described here. For in-house engineering, the total wages attributable to employee time spent directly on transportation projects in one year is added to all annual overhead costs, which are costs incurred in the support of employees with direct project responsibilities. Overhead costs include administrative and facility costs, but also all fringe benefit costs and wages earned by engineering employees for time not spent directly working on projects (training, time off with pay, etc.). The sum of the annual direct wages and annual overhead costs is divided by the total number of hours charged directly to projects, to generate an average, hourly cost for project work. For the consultant costs, the Department computes a weighted average of the hourly cost of all consultant firm contracts entered into during the fiscal year (with an adjustment to remove payments for direct costs, such as travel expenses, since these are not included in the in-house rate).

23. According to the Department's analysis for fiscal year 2011-12, the average, full cost (direct labor cost plus overhead) of an hour of engineering services done by in-house staff was \$70.20, while the full cost of an hour of engineering services provided by consultants was \$91.16. This hourly rate for consultant services was 30% higher, in that year, than the hourly rate for in-house staff.

24. Several questions have been raised by legislators and others regarding the impacts that any differences between the benefits received by state employees and those received by consultants have on the Department's cost comparison analysis. For instance, if, as some have maintained, state employees receive more time off with pay or must spend more time doing non-project duties such as training, then consultants would, in effect, provide more productive hours in a year than state employees. However, the DOT analysis compares the cost of an hour spent actually working on a project, not all employee time. For in-house staff, wages paid for hours not spent working on a project are included in the overhead costs, which matches the treatment of consultant

costs. Consequently, if consultants actually work more hours directly on projects, that effect is more than offset by the higher costs charged by consultants for wages, overhead, and the consultant's fee.

25. Similar questions have been raised regarding employee fringe benefits. That is, some have speculated that if state employees receive more generous retirement benefits than consultant employees, the analysis may not take into consideration those future costs. However, the state employer share of the pension contribution is included in the in-house overhead total. Since the state's pension system is fully funded and actuarially sound, all future costs associated with employee benefits are captured in the overhead rate.

26. Using the hourly cost comparison, the Department estimates the cost savings that could be achieved by replacing work done by consultants with work done by the new engineering positions. To calculate these savings, the Department assumes that each new employee would contribute, on average, 1,450 hours to project work on an annual basis, an estimate based on the current time allocation for engineering staff (the other 630 hours of the annual total are devoted to non-project duties and time off). Multiplying 1,450 by 180 generates an estimate of 261,000 new project hours work done by state staff. At the average, hourly cost of in-house engineering services (including overhead rate), the cost of those hours is estimated at \$18.3 million. By comparison, the cost of procuring the same number of hours from consultants, using the average consultant hourly rate would be \$23.8 million, a difference of \$5.5 million. This difference is the savings that the Department identifies with the proposal.

27. It should be noted that this estimate uses the average, hourly cost rates, including overhead, even though actual costs associated with the new employees would differ from the average. That is, in 2014-15 (the first full year of employment for the new positions), the total costs associated with the new employees would be \$15.6 million, or \$2.7 million less than the cost derived using the average cost methodology. There are a few possible reasons for the difference. The lower cost is due in part because the marginal cost of adding an employee can be expected to be lower than the average cost. Some of the costs that are included in the overhead rate calculation would not increase with the addition of new employees. For instance, the Department indicates that most, if not all, of the new positions could be absorbed within current space available at the regional and central offices. Likewise, expenditures associated with human resources and payroll would not increase in proportion to the increase in new employees.

28. Another reason that the actual cost of the 180 positions under the bill would be lower than the cost calculated using the average, hourly rate is because many of the new positions would be entry level, and so would be paid less than the average wage of current engineering staff. However, since the cost of the additional state employee hours must be compared to the cost of the same number of consultant hours using the average, hourly consultant rate, the use of the average hourly cost rate for in-house staff provides a more consistent basis of comparison.

29. In some respects, the \$5.5 million savings estimate is conservative, since, as indicated above, the Department would not incur the full overhead costs in proportion to additional direct costs. Also, the Department's costs associated with managing the consultant program, such as the contract solicitation, negotiation, and consultant firm rating process, are not included as a

consultant cost in the analysis, even though these costs could be reduced if the Department were to reduce its use of consultant engineering services.

30. In other respects, the estimate may not take into consideration other factors that cannot be quantified and that make it difficult to develop a precise estimate of any cost advantages of in-house staff. For instance, the Department's analysis assumes that, on an hour-for-hour basis, an in-house engineer and a consultant engineer are equally productive. Since engineering services generally cannot be quantified into uniform units of equal quality, it is not possible to reliably measure or compare productivity.

31. The Department acknowledges the methodological limitations associated with the savings estimate presented in the previous points, including the use of an hour of work as a unit of analysis in its hourly rate study. Nevertheless, the Department argues that the estimated savings are generally indicative of the savings that could be expected by replacing work done by consultant engineers with Department employees. As an alternative method of confirming the cost advantage of state engineering staff, the Department conducted a study in 2011 that compared the total cost of delivery (design and construction engineering, including an overhead multiplier) of individual projects as a percent of the construction cost for consultant-led and in-house staff-led projects. For the purpose of this comparison, the Department grouped projects completed between 2004 and 2010 in five categories: highway maintenance pavement repair, bridge, rehabilitation, reconstruction, and major projects (southeast Wisconsin freeway megaprojects were not included since consultants do the bulk of the engineering for these projects). In each of the categories, the delivery cost percentage for projects led by consultant engineers was higher, as a percent of construction cost, than those led by in-house staff, and for the total of all categories the delivery cost percentage for consultant-led projects was 18.7% higher.

32. The Department notes that many projects use a mix of consultants and in-house staff, which somewhat complicates the comparison of the delivery cost percentages. [For the purposes of the study, a project was considered to be an in-house-led or consultant-led project if more than 60% of the cost was incurred for in-house or consultant engineering services, respectively.] The difficulty of conducting a true cost comparison has been noted elsewhere. The GAO's 2008 report on the state use of engineering consultants reviewed several cost comparison studies, noting that while most such studies reached the conclusion that the cost of conducting engineering with in-house staff is less costly, many have methodological limitations that make precise estimates of the cost differential impossible. Most notably, while comparative studies make an attempt to compare engineering costs for similar types of projects, there may be systematic differences in the types of projects done by consultant engineers and those done by in-house staff that may skew the results of a cost comparison.

33. Despite the methodological issues that make it difficult to develop precise estimates of the cost differential, there are other indications that the per employee labor costs for in-house staff are lower than for consultants. The Department indicates, for instance, that it is common for staff engineers to leave state jobs for private sector opportunities, suggesting that the employees themselves view the total package of wages and benefits offered by consultants as better than those offered by the state. [The Department indicates that employees of consultants sometimes leave their

firm to work for the Department, although this appears to be much less common.] In exit surveys conducted over a three-year period, the Department found that 35% of engineers who resigned were leaving to take a private sector position, making it the most common reason, ahead of retirement (25%), project position expiration (18%), and all other reasons (22%). This would be consistent with the belief of many state transportation officials who, when interviewed by GAO for the 2008 report, indicated that the compensation package (salaries and benefits) offered by private consultant firms are often higher than those offered by state agencies. Despite this difference, some engineers may prefer working for the state, which, the Department argues, allows the state to achieve savings by increasing the amount of work conducted by state employees.

34. Although the Department estimates that the position initiative would result in savings estimated at \$5.5 million on an annual basis, the bill would not reduce funding in any program to reflect these savings. Instead, any savings that accrue because of the creation of the positions would reduce overall engineering costs, allowing additional funding to be allocated to transportation projects. As noted in the discussion of the cost comparison methodology, the estimate is based on average, hourly costs, including full overhead, which may not match actual conditions that could be expected with the hiring of 180 new positions. Initially, the new employees would have to be recruited, hired, and trained, meaning that the annualized savings would not be immediately realized. Nevertheless, the Department notes that although entry-level engineers would require additional training, they would be assigned tasks that would otherwise be done by consultant engineers with a similar level of experience. Consequently, DOT expects that savings could be realized by 2014-15.

35. In light of a projected \$54.3 million deficit in the transportation fund (based on revenue and expenditure reestimates outlined in LFB Paper #635 and the Committee's actions to date), it will be necessary to reduce funding for transportation programs or increase transportation fund revenues to achieve a positive fund balance. As an alternative toward this end, the Committee could reduce funding in the state highway rehabilitation program by \$5,500,000 in 2014-15 to reflect the Department's estimate of savings associated with the positions (Alternative B2a).

36. Some legislators have expressed concerns over the total number of positions that would be created under the bill. The initiative to add 180 engineering positions is the largest position increase item in the bill. The Department identified the position initiative as one of its highest priorities in its agency budget request, but indicates that, if a reduction is necessary, then a higher priority would be placed on the 145 project development positions in the regional offices. The Department believes that the project development capacity in regional offices is currently deficient, and it is necessary to have more in-house staff gaining field experience to enhance the Department's internal expertise. If the Committee eliminated the other 35 positions (those that would be assigned to the Department's statewide bureaus), then \$2,283,100 in 2013-14 and \$3,044,100 in 2014-15 would be transferred from the state highway rehabilitation lines for salary, fringe benefits, and supplies and services to the line for contractual services (Alternative A2). Under this alternative, the Department would not be able to take advantage of any cost savings associated with replacing consultants in the statewide bureaus. In addition, any benefits, discussed earlier, of having enhanced in-house expertise to improve the dissemination of best practices and advanced technologies on a statewide basis would not be realized. [Ultimately the Department has

flexibility on how the new positions would be utilized, and it is possible that, under this alternative, some would be assigned to the central office.] If the Committee decides to reduce funding to recognize the Department's estimate of the savings associated with the new positions, then the reduction associated with Alternative A2 would be \$4,430,000 in 2014-15, or \$1,070,000 less than under the full, 180-position initiative (Alternative B2b).

ALTERNATIVES

A. Positions

1. Approve the Governor's recommendation to provide 180 SEG positions annually to increase the number of Department highway engineers and related technical positions and to transfer \$11,741,500 SEG in 2013-14 and \$15,655,300 SEG in 2014-15 from the state highway rehabilitation budget line for engineering consultant services to the delivery budget line for the highway improvement program to fund the salary, fringe benefit, and supplies costs associated with the new positions.

2. Modify the Governor's recommendation by eliminating 35 SEG positions annually, to eliminate the positions that would be assigned to the Department's statewide bureaus, and reduce the transfer from the budget line for contractual services by \$2,283,100 in 2013-14 and \$3,044,100 in 2014-15.

ALT A2	Change to Bill
	Positions
SEG	- 35.00

3. Delete provision.

ALT A3	Change to Bill
	Positions
SEG	- 180.00

B. Estimated Savings Reduction

1. Approve the Governor's recommendation to not modify the funding for the state highway rehabilitation program for estimated savings associated with replacing consultant engineering services with in-house staff.

2. Reduce funding to recognize estimated savings associated with replacing consultant engineering services with in-house staff, as follows:

a. By \$5,500,000 in 2014-15, which is the Department's estimate of annualized savings associated with 180 positions.

ALT B2a	Change to Bill
	Funding
SEG	- \$5,500,000

b. By \$4,430,000 in 2014-15, which is the estimated annualized savings associated with 145 positions.

ALT B2b	Change to Bill
	Funding
SEG	- \$4,430,000

Prepared by: Jon Dyck
Attachment

APPENDIX

Hourly Engineering Cost Study Methodology

The calculation of the average, hourly rates for engineering services follows these steps, shown first for in-house staff and then for consultants:

A. *Calculate total direct labor cost for in-house staff charged to projects.* All DOT employee work time is given a program code on timesheets, which "charges" that time to a particular program or project. In this first step, all wages that are charged directly to a transportation project are tallied to arrive at the total, direct wage cost. It should be noted that the total calculated in this step includes only wages associated with time spent working directly on projects, not wages earned by employees for time spent on other duties, such as training, or for time off.

B. *Calculate total overhead costs associated with the in-house direct labor.* In order to compare in-house cost with consultant costs, all other costs incurred in support of, or in consequence of, the employment of project development staff are tallied. In this step, the Department makes the distinction between: (a) costs in support of in-house staff working on projects ("support costs"); and (b) costs incurred for the transportation development program in general ("general costs"). Conceptually, the support costs are incurred because of having in-house engineering staff and would not be incurred if the Department procured all engineering services from consultants. These costs are included in the overhead rate. General costs, which are excluded from the overhead rate, would be incurred regardless of the level of consultant work used. The following points describe the costs that are included in the overhead rate and which are excluded, by broad category:

1. *Division of Transportation System Development (DTSD) administrative and other costs.* Human resources, payroll, purchasing, information systems, and administrative time of managers and supervisors that is not charged directly to projects is included in the overhead rate. General program management and costs associated with consultant contract oversight are excluded, as general costs. Other costs, such as labor costs associated with training, supervision, and professional development, and non-labor costs for travel and permanent property (work stations) are included if they are in support of employees working on projects, but are excluded if they are more general in nature. The administrative costs for the DTSD bureaus that provide general program oversight (such as the Bureau of Program Development and the Bureau of Technical Services) are excluded from the overhead rate since these costs are incurred regardless of the level of engineering work done by in-house staff. The labor costs for support personnel include both wages and fringe benefits.

2. *Division of Transportation Investment Management (DTIM).* All DTIM costs are excluded from the overhead rate since they are related to the general financial management and planning for the transportation programs.

3. *Facilities.* Facilities costs, including depreciation, are apportioned to the indirect

rate calculation in proportion to the number of DTSD employees.

4. *Division of Business Management (DBM).* General Department administrative costs are allocated to the indirect rate calculation in proportion to the number of engineering and related employees associated with the transportation improvement programs.

5. *Time off with pay.* All wages received by in-house staff for time off with pay are included in the overhead rate.

6. *Fringe benefits.* The fringe benefits costs (employer's share of health insurance premiums and pension system contribution) of in-house staff whose time is charged to projects are included in the overhead rate. Since the state's pension system (including the sick leave conversion benefit) is fully funded and actuarially sound, all future costs associated with employee benefits are captured in the overhead rate.

7. *Executive offices.* The budget for the Department's executive offices (Office of the Secretary, Office of Budget, Policy, and Finance, etc.) is apportioned to the overhead rate in proportion to the in-house staff salary attributable to the transportation improvement programs.

C. *Calculate the total, average, hourly rate for in-house engineering services.* The total of the direct labor costs calculated in the first step and the total of the overhead costs from the second step is divided by the total number of hours spent directly working on project work (also derived from time sheets) to derive an average, hourly cost of in-house staff engineering services.

D. *Calculate an average hourly rate for consultant engineering services.* The average, hourly consultant rate is computed using a weighted average of hourly rates, derived from all contracts entered into during the fiscal year. In the case of the hourly consultant rate, the overhead costs (administration, facilities, time off with pay, the firm's fee, etc.) are included, along with direct labor costs, in the amount paid by the Department under the contract. Contract hourly rates are used rather than actual payments to consultants during the year since actual payments do not distinguish between different cost items. Since the Department removes direct costs, such as travel expenses, from the consultant hourly rate (to compensate for the fact that direct costs are not included in the in-house overhead rate), then it is necessary to use the contract hourly rates, which distinguishes between different cost items and estimates the number of hours.

E. *Compare the average hourly rate for in-house and consultant engineering services.* Once the hourly rates for in-house and consultants have been calculated, these rates can be directly compared.