STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
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Office of the
Commissioner

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December 20, 2010

Mr. Gale A. Mattison
Chairman, Privatization Contract Committee
State Contracting Standards Board
State Office Building
165 Capitol Avenue, Room 173
Hartford, Connecticut 06106

Dear Mr. Mattison:

Subject: Cost-Benefit Analysis for Railroad Bridge, Mast Arm and Sign Support Inspections (Based on Analysis of FY 2010 Consultant Expenditures)

Enclosed is the Department of Transportation's (Department) draft response to the Privatization Contract Committee's (Committee) request for the Department to perform a Cost-Benefit Analysis on our Railroad Bridge, Mast Arm and Sign Support inspections for FY 2010. Since there are not any published procedures, the Department's draft analysis is the beginning of a dialogue between impacted stakeholders. It is vital, regardless of the outcome, that the Department have continuous access to adequate resources to ensure that the bridges are inspected on schedule and that there are safeguards to ensure that there is capacity and flexibility to support emergency situations.

The Department looks forward to working with the Committee to ensure that the safety of the traveling public is at the forefront of these discussions.

Sincerely,

Jeffrey A. Parker
Commissioner

Enclosures

cc: Mr. Robert Dakers, Office of Policy and Management
Ms. Wanda Dupuy, Office of Policy and Management
Ms. Patti Maroney, Office of Policy and Management

Department of Transportation
Cost-Benefit Analysis (CBA) of Mast Arm, Sign Support, and Railroad Bridge Inspections performed by Consultant in FY 2010

I.) Introduction

On June 28, 2010, the Privatization Committee of the State Contracting Standards Board (SCSB) wrote to the Department requesting background information related to the Department's Bridge Inspection Program. The Department responded in writing on July 28, 2010 and also provided testimony on the issue on September 15, 2010. Subsequent to the Department's testimony, the Department wrote to the SCSB requesting they consider dividing any proposed CBA of the Bridge Inspection Program into two tasks. The first would perform a CBA on the Mast Arm and Railroad Bridge inspections, which would then be followed by a CBA for the remaining Bridge inspections. On October 14, 2010, the SCSB met and adopted a resolution to accept the Department's suggestion. The Core-CT ProjectID's associated with the initial CBA; Mast Arm and Railroad Bridge inspections as well as Sign Support inspections (which were added to the CBA) are highlighted below and are the starting point for the Department's phase 1 analysis.

Bridge Inspection Expenditures by Project - FY2010

Project Description	Core-CT ProjectID	In House Payroll (Salary, Fringes, & Additives) FY10	In House Non-Salary FY10	Outside Payments FY10	Total FY10
Sign Support Inspection	DOT0170273OPE	$ 99,993	$ -	$ 2,108,764	$ 2,208,756
Inspection of On/Off System Bridges		$ 822,888	$ -	$ 8,265,988	$ 9,088,876
Underwater Bridge Inspections		$ 999	$ -	$ 206,335	$ 207,334
Underwater Bridge Inspections		$ -	$ -	$ 86	$ 86
Underwater Bridge Inspections		$ -	$ -	$ 728,141	$ 728,141
Inspection of Traffic Signal Mast Arms	DOT01702614PE	$ 1,246	$ -	$ 539,278	$ 540,524
Underwater Non-Part Bridge Inspections		$ -	$ -	$ 137,109	$ 137,109
Sign Support Inspection		$ -	$ -	$ 310	$ 310
Inspection of New Haven Line RR Bridges	DOT03000097PE	$ 292,290	$ -	$ 1,830,789	$ 2,123,079
Scour Analysis/Monitoring-NBI Bridges		$ -	$ -	$ 48,194	$ 48,194
Scour Analysis/Monitoring-Non NBIS Bridges		$ -	$ -	$ 8,298	$ 8,298
Inspection of various RR Bridges	DOT01702010PE	$ 24,086	$ -	$ 702,044	$ 726,142
Consultant Inspected Project Expenditure Totals:		$ 1,241,514	$ -	$ 14,575,335	$ 15,816,850
Statewide Non-NBI Bridge Inspection		$ 366,188	$ -	$ -	$ 366,188
Statewide On/Off System Bridge Inspection		$ 3,259,693	$ 692,808	$ -	$ 3,952,501
Statewide On/Off System Bridge Inspection		$ 2,410,067	$ 414,063	$ -	$ 2,824,129
In-House Inspected Project Expenditure Totals:		$ 6,035,948	$ 1,106,871	$ -	$ 7,142,819
	= Included in initial CBA Analysis			$ 5,130,875	

II.) Methodology

The Mast Arm and Sign Support inspections were analyzed by the Department as a group, as were the New Haven Line and Various Railroad Bridge inspections. The Department worked with the Office of Policy and Management on the following analysis:

a) The Department identified, in detail, the consultant expenditures for the period under review. Payroll expenditures were grouped by the employee title, including hours billed, and direct costs were grouped by category.

b) The Department then proceeded using the assumption that the estimated hours required if the work were to be performed by State forces would be the same as the hours incurred by the consultant.

c) To calculate the employee titles required for State forces, each consultant title was reviewed and a corresponding State employee title identified.

d) The equivalent State forces titles were then combined with the associated consultant hours into a matrix.

e) To annualize the consultant billing hours for analysis purposes, the Department utilized the FY 2010 Leave Additive rate of 22.46 percent. The total annual hours of 2,080 were reduced by the average leave additive rate to estimate the annual "billable" number of productive hours at 1,612.83. This estimate was used to divide the actual consultant hours and calculate the estimated number of State employees that would be required for each title (rounding up for fractions of employees).

f) An average hourly rate of pay for each State employee title was calculated by analyzing the Department's actual average rate for that title for FY 2010. The hourly rate was then converted into an annual salary which was summarized to develop the estimated State forces payroll for analysis purposes.

g) Actual and estimated payroll fringe percentages, and average longevity additive were then applied to the estimated State forces payroll to complete the analysis of inspection labor.

h) The Department then reviewed the consultant direct cost expenditures. Based on the review of the categories billed, the Department assumed that if the work were to be performed by State forces, the direct costs would generally be the same.

i) The Department next analyzed the in-house payroll charges incurred in FY 2010 to determine if the in-house employees would still be required if State forces were to perform the work. The cost for hours that was determined to be required were included in the analysis, while the hours that were determined to no longer be required were deducted from the estimated payroll matrix described above in sub-section "d".

j) The Department next estimated the additional direct expenditures that would be required if these inspections were to be performed by State forces. Costs for equipment, supplies, training, etc. were estimated and included in the analysis.

k) Finally, an estimated indirect cost rate was included in the analysis. This rate was provided to the Department by the Office of Policy and Management and calculated by taking an average of actual indirect cost rates established by other State agencies. The rate was applied to both the State payroll estimated for inspection services and the previously identified in-house payroll charged directly to the project.

l) One additional step was also required for the Mast Arm and Sign Support analysis. Consultant expenditures for the period under review greatly exceeded the average number of inspections required, assuming a four-year inspection cycle. It was decided to prorate the consultant expenditures down to reflect 25 percent of the total required inspections. By doing so, the resulting estimated number of State forces required to perform the work would be more in-line with actual requirements and would therefore result in a more understandable analysis.

III.) Additional Issues

Additional issues not specifically addressed in the Department's CBA:

- The Department's CBA reviews FY 2010 consultant expenditures for Mast Arm, Sign Support and Railroad Bridge inspections incurred utilizing a total of six different State contracts. Four of these contracts expired on June 30, 2010. In preparing this analysis, the Department utilized the expenditures from FY 2010, which included the expenditures of all six contracts in place in FY 2010. Since there was no expenditure history, the four contracts which expired were used, versus the new contracts which were effective on July 1, 2010. It is also important to note that when these consultant contracts were selected, quality and experience were at the center of the decision making process and price was not utilized as a factor in the consultant selection phase, which is consistent with the Federal Brooks Act.

- Staffing levels – If the inspections were to be performed entirely by State forces, the appropriate staffing levels and organization structure would need to be maintained. Bridge inspection schedules cannot be delayed if the Department is to ensure that the safety of the traveling public is maintained. The length of time typically required to refill vacancies could become an issue if there were no alternative resources.

- Specialized Bridge Inspection Expertise – Some bridges have features that require specialized expertise. Movable bridges are good examples of structures that require specialized expertise. The workload for these specialized areas does not justify hiring in-house personnel to perform the tasks, so the Department's analysis believes that this type of work would continue to be performed by a consultant.

- Unanticipated Inspection Needs – Staffing losses, weather events, significant changes in the condition of our structure inventory can, and do, occur from time to time. The Department has historically relied upon consultant contracts to fill the inspection voids and this would have to be continued if the Department is to ensure that inspection schedules are maintained.

- The Department's CBA compares actual consultant costs to estimated State forces expenditures for the same work. It should be noted that the Department awards consultant contracts based on qualifications, not on price.

- The Department is concerned that if the results of this analysis were to require a shift of work entirely to State forces, then if a situation were to arise that required an immediate increase in inspections, as was the case initially with Mast Arms, then there would not be the available consultant forces required to supplement our workforce.

- Consultant forces currently perform minor routine maintenance activities such as sign clip replacement and bolt tightening while deployed for the structure inspection. The analysis

assumes State bridge inspectors will also perform these activities providing a consistent level of efficiency. This will require changes to current union job specifications for the Bridge Inspection series.

- The application of the principles of structural engineering is unique to the field of railroad bridge inspection and engineering. The overall configuration and details of the design and construction of railroad bridges differ greatly from other classes of structures to the extent that effectively inspecting these features requires specific experience, as well as an understanding of the fundamentals of railroad bridge structural engineering.

- The Department's CBA identifies the estimated additional costs for training, equipment, and supplies required if the inspections were to be performed by State forces. It should be noted that the Department amortized items with a useful life of more than one year for analysis purposes, but would require full funding in the first year if these items were actually to be purchased.

IV.) Summary

The Department's analysis of Railroad Bridge, Mast Arm and Sign Support inspections is intended to provide a baseline for the discussion involving this complicated issue. Throughout the analysis, the Department attempted to accurately present the facts relating to our bridge inspection consultant expenditures for FY 2010, and where assumptions were required, to clearly identify those assumptions that were included in the analysis. It is vital, regardless of the final outcome, that the Department have access to adequate resources to ensure that the bridges are inspected on a timely basis and that there are safeguards to ensure that there is capacity and flexibility to support emergency situations. The Department looks forward to working with the Committee to ensure that the safety of the traveling public is at the forefront of these discussions.

The results of the Department's analysis are included in Attachments A and B.

A) Railroad Bridge Inspections – The direct project expenditures (including retainages held) related to consultant railroad bridge inspections for FY 2010 was $2,899,461.45. The results of the Department's analysis, estimate the cost if that work were to be performed by State forces to be $2,881,738.11, not including the application of an estimated indirect cost rate, and $2,949,703.10 verses $3,283,515.91 if an estimated indirect cost rate were applied. These amounts, when comparing consultant costs to estimated State forces costs, equate to an increase of 0.6 percent and a decrease of 10.2 percent respectively.

B) Mast Arm and Sign Support Inspections - The direct project expenditures (including retainages held) related to consultant Mast Arm and Sign Support inspections for FY 2010 was $2,791,628.29. After prorating those costs to reflect 25 percent of the total inspections required, the amount presented in the analysis is $1,467,723.97. The results of the Department's analysis estimate the cost if that prorated work were to be performed by State forces to be $1,418,120.08, excluding the application of an estimated indirect cost rate, and $1,474,809.26 verses $1,584,955.18 if an estimated indirect cost rate were applied. These amounts, when comparing consultant costs to estimated State forces costs, equate to an increase of 3.5 percent and a decrease of 6.9 percent respectively.

Attachment A

Cost Benefit Analyis Summary Sheet Railroad Bridge Inspections (Based on Analysis of FY2010 Consultant Expenditures)			
Expenditure Description	**Actual Consultant Costs**	**Est. State Forces Costs**	**Comments**
Payroll:	$ 942,549.43	$ 1,372,108.32	16 Employees
Consultant Burden, Fringe & Overhead:	$ 1,185,631.67		
State Fringes & Additives:			
Unemployment Compensation 0.29%		3,979.11	
Retirement 39.85%		546,785.17	
Est. Social Security 6.20%		85,070.72	
Medicare 1.45%		19,895.57	
Est. Life Insurance 0.14%		1,920.95	
Est. Medical Insurance 16.94%		232,435.15	
Workers Compensation 2.20%		30,186.38	
Longevity Additive 2.44%		33,479.44	
Fringes on Longevity Additive 60.6% of Longevity		20,288.54	
Total State Fringes & Additives:		$ 974,041.04	
Consultant Fixed Fee for Profit:	$ 209,448.05	$ -	
Direct Costs:	$ 245,444.30	$ 232,692.85	Assumed same as consultant with the exception of RR Insurance
In-House Payroll/Fringes Charged Directly:	$ 316,388.00	$ 231,722.57	State Forces oversight carried forward at 73.24% *
Additonal Costs for Training, Equipment and Supplies required if work were performed by State Forces		$ 71,173.33	
Total Cost Analysis A - (without Indirect Costs):	**$ 2,899,461.45**	**$ 2,881,738.11**	
Variance from Estimated State Forces Expenditures (without application of an Indirect Cost Rate):	**0.6%**		
DOT Estimated Indirect Costs on Inspection Direct Labor (26.60%):	$ -	$ 364,980.81	State Average Indirect Cost Rate supplied by OPM
DOT Estimated Indirect Costs on In-House Direct Labor (26.60%):	$ 50,241.65	$ 36,796.99	State Average Indirect Cost Rate supplied by OPM
Total Cost Analysis B - (with Indirect Costs):		**$ 3,283,515.91**	
Variance from Estimated State Forces Expenditures (including application of an Indirect Cost Rate):	**10.2%**		

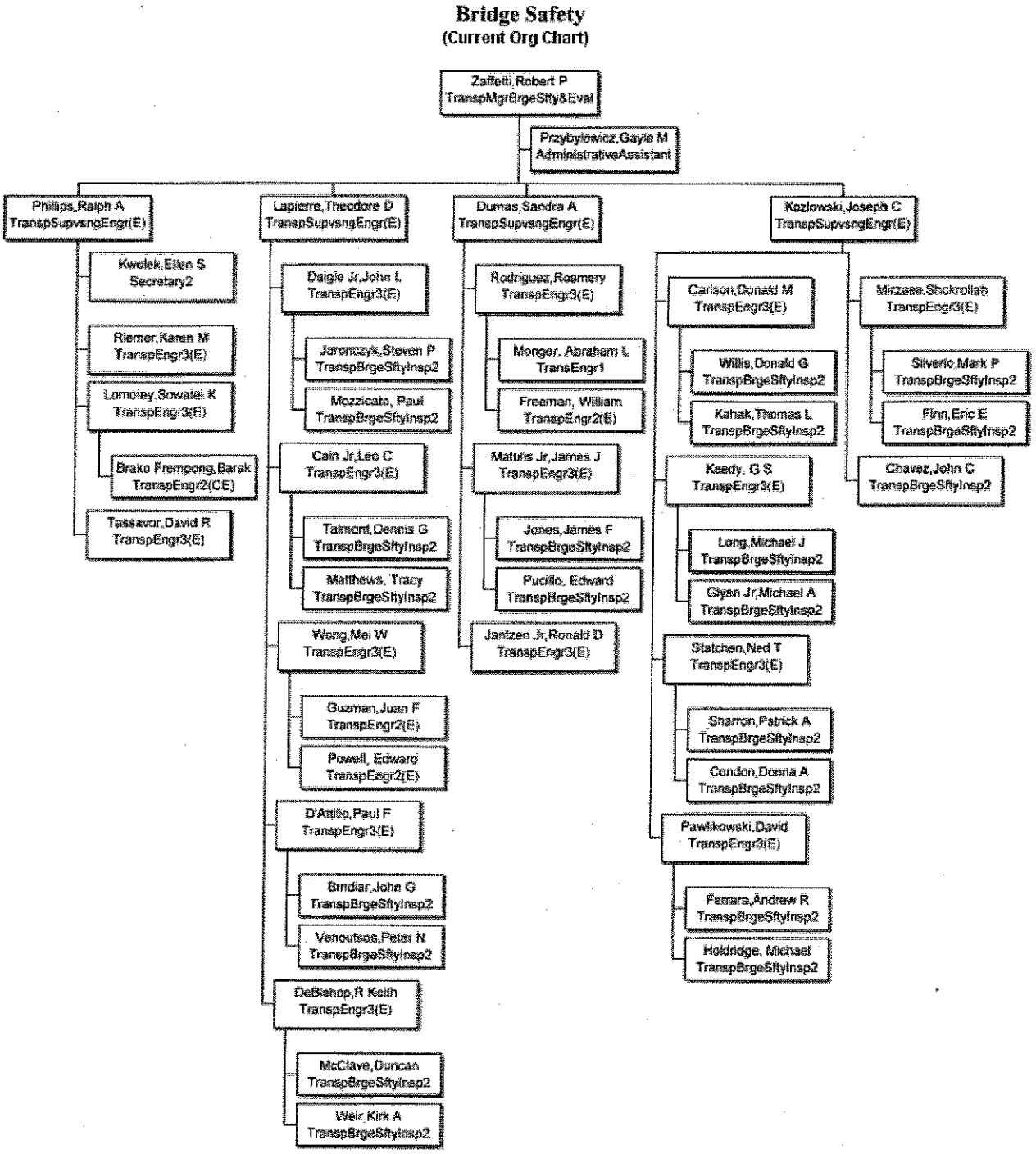
* In-House Payroll/Fringe Expenditures include both Consultant Inspection Oversight as well as Inspection Report Review and Coordination of the methods to address findings. The Inspection Report Review and Coordination portion will continue on, but the Consultant Inspection Oversight will not be required. This portion has been calculated at 26.76% and since it will no longer be required, those hours were used to reduce the additional State Employees required to perform Inspection. The remaining 73.24% of the original $316,388 In-House expenditures, ($231,722.57) will be carried forward in the analysis as ongoing oversight.

Attachment B

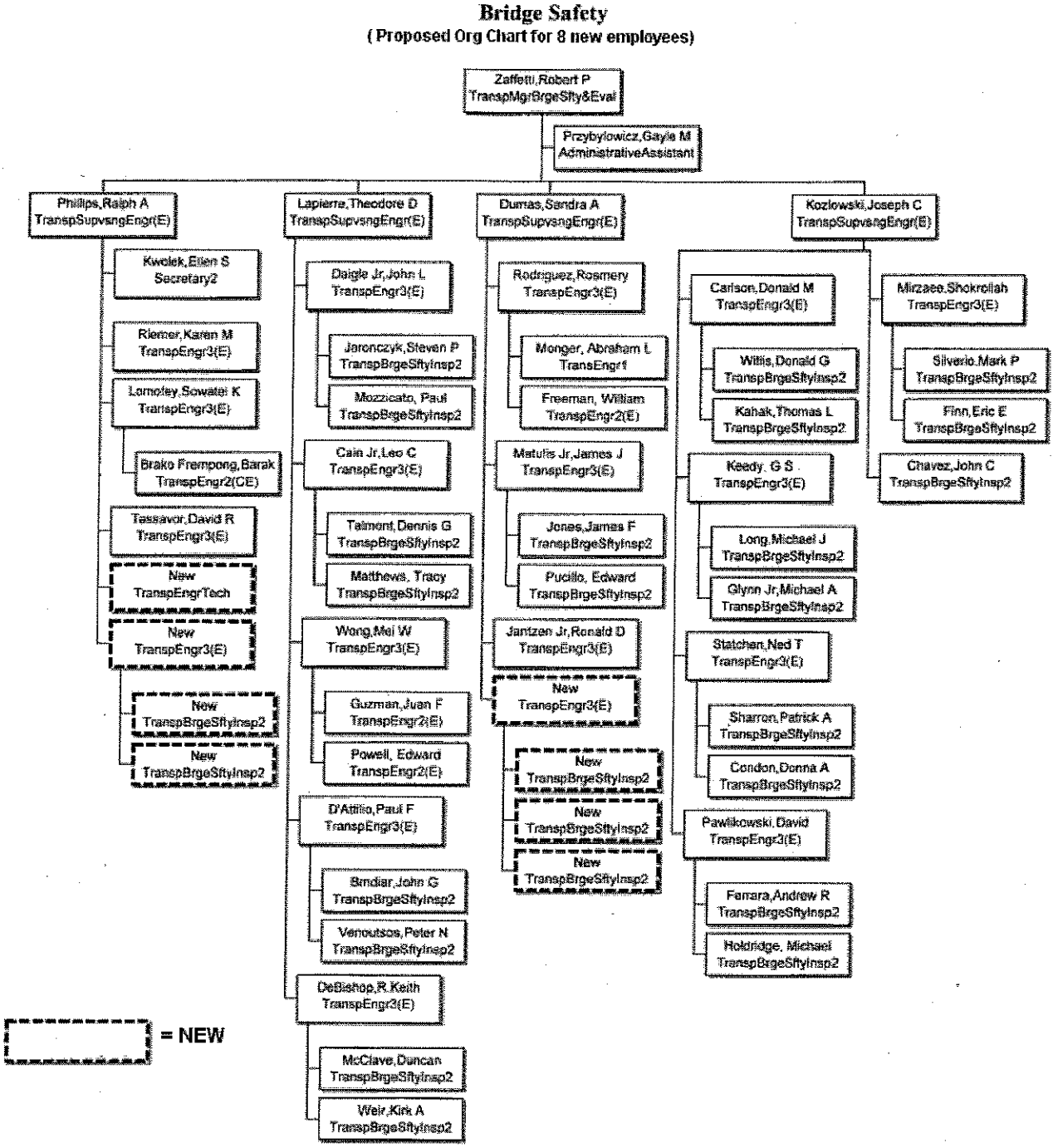
Mast Arm and Sign Support Inspections (Based on Analysis of FY2010 Consultant Expenditures)			
Expenditure Description	**Actual Consultant Costs**	**Est. State Forces Costs**	**Comments**
Payroll:	$ 400,418.16	$ 600,563.20	8 employees
Consultant Burden, Fringe & Overhead:	$ 599,827.27		
State Fringes & Additives:			
Unemployment Compensation 0.29%		1,741.63	
Retirement 39.85%		239,324.44	
Est. Social Security 6.20%		37,234.92	
Medicare 1.45%		8,708.17	
Est. Life Insurance 0.14%		840.79	
Est. Medical Insurance 16.94%		101,735.41	
Workers Compensation 2.20%		13,212.39	
Longevity Additive 2.44%		14,653.74	
Fringes on Longevity Additive 60.6% of Longevity		8,880.17	
Total State Fringes & Additives:		$ 426,331.66	
Consultant Fixed Fee for Profit:	$ 88,799.99	$ -	
Direct Costs:	$ 321,710.09	$ 321,710.09	Assumed same as consultant
In-House Payroll/Fringes Charged Directly:	$ 56,968.46	$ 56,968.46	Same prorated amount as Consultant.
Additonal Costs for Training, Equipment and Supplies required if work were performed by State Forces		$ 12,546.67	
Total Cost Analysis A - (without Indirect Costs):	**$ 1,467,723.97**	**$ 1,418,120.08**	
Variance from Estimated State Forces Expenditures (without application of an Indirect Cost Rate):	**3.5%**		
DOT Estimated Indirect Costs on Inspection Direct Labor (26.60%):	$ -	$ 159,749.81	State Average Indirect Cost Rate supplied by OPM
DOT Estimated Indirect Costs on In-House Direct Labor (26.60%):	$ 7,085.29	$ 7,085.29	State Average Indirect Cost Rate supplied by OPM
Total Cost Analysis B - (with Indirect Costs):		**$ 1,584,955.18**	
Variance from Estimated State Forces Expenditures (including application of an Indirect Cost Rate):	**6.9%**		

V.) Organizational Charts

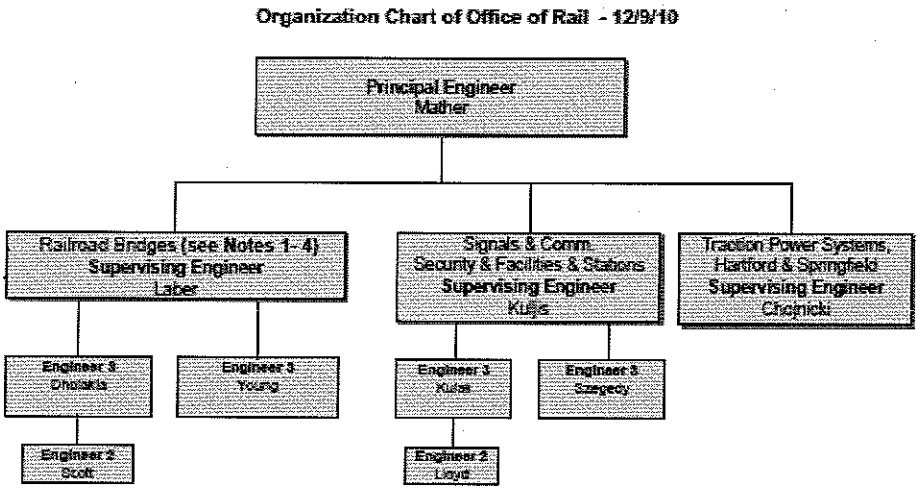
Bridge Safety Unit – Current



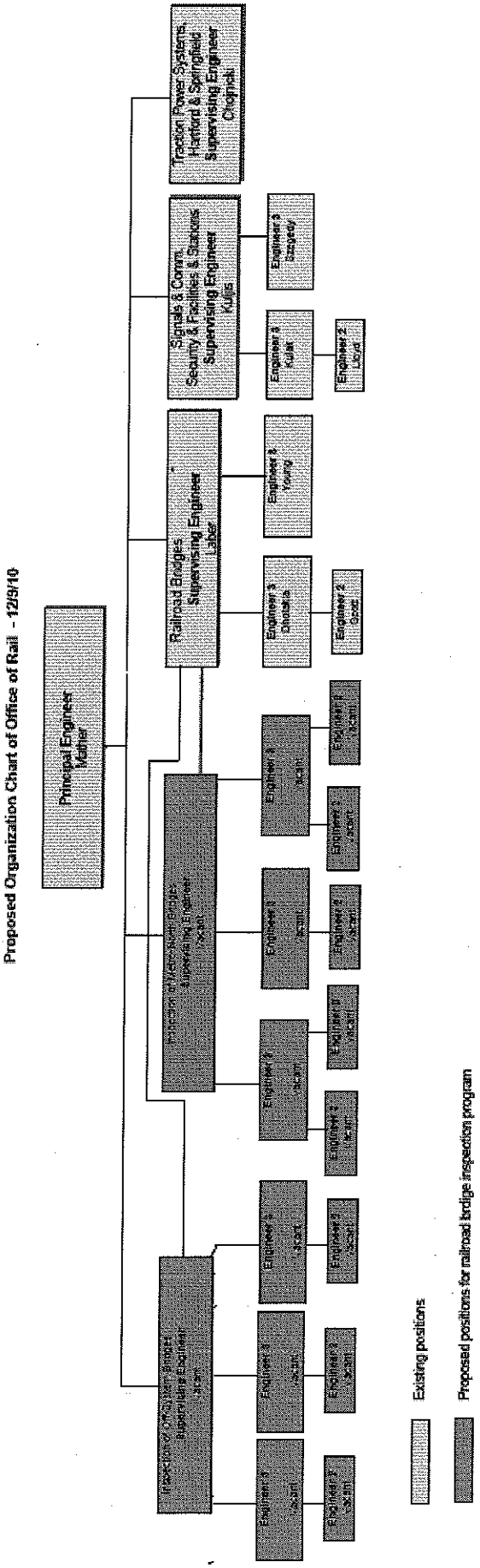
Bridge Safety Unit – with Additional Staffing



Office of Rails – Current



Office of Rails – with Additional Staffing



VI.) Supplemental Information

1.) Details relating to Consultant Invoice Receipts utilized in this CBA, which were downloaded from Core-CT, are available in the pages marked as "B" of the Supplemental Information PDF file.

2.) Details relating to the receipts identified in Item 1 above including individual consultant payroll rates and hours billed, direct costs billed and equivalent State employee titles assigned are not included in this package because of the size, but are available upon request.

3.) Details relating to the analysis of in-house expenditures for Railroad Bridge inspections are available in the pages marked as "D" of the Supplemental Information PDF file. As part of the analysis of in-house expenditures, administrative hours associated with contract development, invoice processing and audits were also reviewed and it was determined that for this analysis there would be no related reduction in personnel if this work were to be brought in-house.

4.) Details relating to the analysis of in-house expenditures for Mast Arm and Sign Support inspections are available in the pages marked as "E" of the Supplemental Information PDF file. As part of the analysis of in-house expenditures, administrative hours associated with contract development, invoice processing and audits were also reviewed and it was determined that for this analysis there would be no related reduction in personnel if this work were to be brought in-house. During the second phase of the CBA, where the non Railroad Bridge inspections are analyzed, there will likely be some reduction of staff in this area which will have to be considered.

5.) Details relating to the analysis of consultant direct costs for Railroad Bridge inspections are available in the pages marked as "F" of the Supplemental Information PDF file.

6.) Details relating to the analysis of consultant direct costs for Mast Arm and Sign Support inspections are available in the pages marked as "G" and "H" of the Supplemental Information PDF file.

7.) Details relating to the calculation of the average hourly rates for State employee titles are available in the pages marked as "I" and "J" of the Supplemental Information PDF file.

8.) The pages marked as "K" of the Supplemental Information PDF file contain detailed information for the Railroad Bridge CBA on how the estimated State employees needed to be hired was calculated, along with the cost of those employees. The equivalent State titles identified in the pages marked as "C" were summarized by title and listed along with the number of consultant hours billed for that equivalent title. The Transportation Engineer Trainee (TET) title was grouped with the Transportation Engineer 2 (TE2) title because the TET is automatically promoted to a TE2 after two years of State service. The in-house consultant oversight hours identified in the pages marked as "D" as being no longer needed if the services were to be performed in-house were assumed to be available to reduce the hours required for this analysis. The net hours were then divided by the estimated productive hours per year to establish the number of in-house employees required to perform the inspection services. Fractions of a year were rounded up to produce the final number of employees required. Overtime requirements were also analyzed and determined to be negligible for work in this area. The annual payroll for these employees was then calculated using the average hourly rates identified in the pages marked as "J".

9.) The pages marked as "L" of the Supplemental Information PDF file contain the Railroad Bridge inspection Summary Sheet which summarizes the information contained in the previous pages.

10.) The pages marked as "M" of the Supplemental Information PDF file contain the calculation of the percentage of work performed for Mast Arm and Sign Support inspections, along with an overall proration percentage and total prorated consultant costs.

11.) The pages marked as "N" of the Supplemental Information PDF file contain detailed information for the Mast Arm and Sign Support CBA on how the estimated State employees needed to be hired was calculated along with the cost of those employees. The equivalent State titles identified in the pages marked as "C" were summarized by title and listed along with the number of consultant hours billed for that equivalent title. The Transportation Bridge Safety Inspector 1 (TBSI-1) title was grouped with the Transportation Bridge Safety Inspector 2 (TBSI-2) title because the TBSI-1 is automatically promoted to a TBSI-2 after one-year of State service. The proration percentage identified in the pages marked as "M" was applied to the consultant hours for analysis purposes and the net hours were then divided by the estimated productive hours per year to establish the number of in-house employees required to perform the inspection services. Fractions of a year were rounded up to produce the final number of employees required. Overtime requirements were also analyzed and determined to be negligible for work in this area. The annual payroll for these employees was then calculated using the average hourly rates identified in the pages marked as "J".

12.) The pages marked as "O" of the Supplemental Information PDF file contain the Mast Arm and Sign Support Summary Sheet which summarizes the information contained in the previous pages.

13.) The pages marked as "P" of the Supplemental Information PDF file contain the calculation of billable hours per year and average longevity additive rate which were determined by taking the average for the last five years rates.

14.) The pages marked as "Q" of the Supplemental Information PDF file contain the calculation of the additional direct expenditures required.