

Considerations for Conducting a Cost Benefit Analysis of CTDOT Performing all Bridge Inspections In-house

September 15, 2010



What Is Required By Section 4e-16 Cost-Benefit Analysis

- (1) The cost-benefit analysis conducted by a state contracting agency prior to entering a privatization contract shall document the:
 - (a) direct and indirect costs **[1]** resulting from implementation of a privatization contract,
 - (b) savings **[2]** resulting from implementation of a privatization contract, and
 - (c) qualitative and quantitative benefits resulting from implementation of a privatization contract.
- (2) Such cost-benefit analysis shall specify the schedule that, at a minimum, shall be adhered to in order to achieve any estimated savings.
- (3) Any cost factor shall be clearly identified in such cost-benefit analysis and supported by all applicable records and reports.
- (4) Any projected costs, savings and benefits must be valid and achievable.
- **[1]** "Costs" means all reasonable, relevant and verifiable expenses, including salary, materials, supplies, services, equipment, capital depreciation, rent, maintenance, repairs, utilities, insurance, travel, overhead, interim and final payments and the normal cost of fringe benefits, as calculated by the Comptroller. As used in this subsection.
- **[2]** "Savings" means the difference between the current annual direct and indirect costs of providing such service and the projected, annual direct and indirect costs of contracting to provide such services in any succeeding state fiscal year during the term of such proposed privatization contract.



Bridge Inspection "101"

- Reference to correspondence from CTDOT Commissioner Parker to Mr. Gale A. Mattison, Chairman, State Contracting Standards Board, dated July 28, 2010 (see the State Contracting Board web site for document)
- CTDOT responsible for 5300 highway bridges (all state bridges and only town owned bridges over 20 feet) and 330 Railroad bridges. They range from 6 foot structures to complex bridges like the Gold Star Truss Bridge and moveable railroad bridges.
- Minimum 2 year frequency, more often as conditions warrant
- 2400 sign support structures and traffic mast arms



Bridge Inspection Current Employee Staffing

- 56 total state staff - inspectors, engineers, supervisors and support staff
- 15 staff engineers and supervisors work in the oversight of 8 consulting firms
- 41 staff are involved with the state inspections. This number includes 22 employees performing the physical inspections and the remainder being engineers, supervisors and support staff.



Inspections Conducted by Employees Versus Consultants

- Current utilization predicated on full utilization of existing staff and the rest is assigned to Consultants
- Attributes considered in the decision to use contract services include:
 - Size of bridge (indicative of manpower commitment)
 - Level of expertise required of the inspection personnel (trusses, movables, etc)
 - Inspection equipment needed



Inspections Conducted by Employees Versus Consultants (cont'd)

- Special workforce requirements (divers, climbers, enclosed space, mechanical and electrical specialties), and
- Home office ability to perform complex/specialty engineering analysis
- The following chart provides two methods of quantifying the current volume of work performed solely by State forces versus Consulting services with a State oversight role. The first is strictly the number of bridges done each way and the second manner is by square foot of bridge.



State Employee and Consultant Bridge Inspections Performed

Totals for Last 4 Years				
Inspection Performed by	Number of Inspections	% of Number of Inspections Completed	Deck Area of Inspections Completed (in Square Feet)	% of Deck Area of Inspections
State	8,606	75%	41,246,799	46%
Consultant - Highway	1,925	17%	45,924,217	51%
Consultant - Railway	575	5%	1,861,081	2%
Divers (Complete)	410	4%	1,130,048	1%
Divers (UW Only)	134			
Total w/o UW Only	11,516		90,162,145	

Fiscal Year 2010				
July 1, 2009 to June 30, 2010				
	Number of Inspections	% of Number of Inspections Completed	Deck Area of Inspections Completed (in Square Feet)	% of Deck Area of Inspections
1 State	2,371	76%	12,231,804	49%
2 Consultant - Highway	440	14%	11,964,117	47%
3 Consultant - Railway	173	6%	606,419	2%
4 Divers (Complete)	138	4%	399,121	2%
Divers (UW Only)	68			
Total w/o UW Only	3,122		25,201,461	

1 - Includes all inspections - Routine, Indepth, Special, Semi-Final, Incident.

2- All types of inspections of State-owned structures carrying Railroad - Metro North and various smaller Freight rail lines.

3 - Includes Complete inspection by Divers due to efficiency or access.

4 - U/W means Underwater Inspection Only - Main Inspection by State Team or Consultant.

NOTE: All totals are as recorded in the Bridge Inspection and Report Management System (BIRMS) as of June 30, 2010 (end of Fiscal Year).



Analysis of Bridge Inspection Expenditures by Category (SFY 2007 – SFY 2010)

Fiscal Year	Consultant Program Expenditures	In-house Program Expenditures	DOT Non-Project	Total	Percentages
FY2007	\$8,597,473	\$6,475,698	\$973,282	\$16,046,453	(54% / 40% / 6%)
FY2008	\$9,719,468	\$4,552,054	\$1,110,239	\$15,381,762	(63% / 30% / 7%)
FY2009	\$15,964,268	\$5,960,769	\$1,302,453	\$23,227,489	(69% / 25% / 6%)
FY2010	\$15,818,929	\$7,142,819	\$1,309,028	\$24,270,776	(65% / 30% / 5%)

- Consultant Program includes oversight costs conducted by state employees of the inspections performed by consultants
- DOT Non Project is an estimate of Bridge Inspection Unit Personnel costs not directly billable to project accounts.
- These expenditures capture the majority of costs, but not all.
- Challenge will be to identify more completely, research past trends, and estimate costs of ALL CTDOT units that assist in the task of bridge inspection.



Analysis of Bridge Inspection Expenditures - FY2010

Project Description	In-House Payroll (Salary, Fringes, & Additives) FY10	In-House Non-Salary FY10	Outside Payments FY10	Total FY10
Sign Support Inspection	\$ 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	\$ -	\$ 934,562	\$ 935,561
Inspection of Traffic Signal Mast Arms	\$ 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	\$ 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	\$ 24,098	\$ -	\$ 704,123	\$ 728,221
Consultant Exp. Totals:	\$ 1,241,514	\$ -	\$ 14,577,414	\$ 15,818,929
Statewide Non-NBI Bridge Inspection	\$ 366,188	\$ -	\$ -	\$ 366,188
Statewide On/Off System Bridge Inspection	\$ 5,669,760	\$ 1,106,871	\$ -	\$ 6,776,631
In-House Exp. Totals:	\$ 6,035,948	\$ 1,106,871	\$ -	\$ 7,142,819



Analysis Of Which Option Or Options Are Best For The State

The intent of this presentation is to provide a preliminary guide as to how the Department might proceed if requested to perform a cost benefit analysis. One consideration is whether or not this analysis should be a comparison of all costs or incremental costs.

As part of this analysis, the Department would:

Estimate the cost to the Department to perform any inspection which is currently contracted out to a consultant.

Compare the estimated cost of having our employees conduct the inspections to the cost of having the consultants perform those same inspections.

The Department will likely categorize the results into the following groups:

small bridges (conducted by state employees and consultants)

larger bridges (conducted by consultants)

specialty bridges (conducted by consultants)



What Steps Need To Be Taken To Estimate Total Costs?



What is an Indirect Cost?

Indirect costs, as defined in the OMB Circular A-87 ⁽¹⁾, are those that have been incurred for common or joint purpose. These costs benefit more than one cost objective and cannot be readily identified with a particular cost objective without effort disproportionate to the results achieved. Examples include Human Resources, Finance, and Payroll.

Where a governmental unit's department or agency has several major functions which benefit from its indirect costs in varying degrees, the allocation of indirect costs may require the accumulation of such costs into separate cost groupings which then are allocated individually to benefitted functions by means of a base which best measures the relative degree of benefit.

(1) OMB Circular A-87 is a circular, issued by the Federal Government, that establishes principles and standards for determining costs for Federal awards carried out through grants, cost reimbursement contracts and other agreements with State and local governments and federally-recognized Indian Tribal governments.



Prepare An Allocation Plan To Compute An Indirect Cost

- Analyze all Department expenditures during the period to segregate direct project expenditures from indirect.
- Evaluate the costs of each Department to determine which are considered to be indirect costs
- Evaluate any costs which are currently being recovered as part of an existing additive rate so that a determination can be made as to how they should be treated in the indirect cost rate (i.e., motor pool)
- Determine appropriate basis of allocation
- Evaluate infrastructure costs (building, depreciation, insurance)



Determine Impact Of Other Allocations/Additives

- Comptroller – State Wide Cost Allocation Plan (SWCAP)
- Comptrollers fringe benefit
- Workers Compensation additive
- Department payroll additives
 - Longevity
 - Vacation, holiday and sick time



Identify Direct Costs

The following units have been identified as having a role in the inspection of bridges conducted by our employees, and periodic involvement in consultant inspections:

- Office of Transportation Maintenance – traffic control
- Hydraulic Drainage and Soils & Foundation – structural stability, erosions, scour and hydraulic issues
- Office of Research & Materials – testing assistance
- State Bridge Design Unit – load evaluations and complex design features
- Survey Unit – measurement of under clearance, roadway alignment and monitoring of survey points

An extensive evaluation of each of these units would need to occur to identify whether or not there are direct charges to the projects, which are part of the baseline, and how these units would be impacted.



Cost Of Inspections Conducted By State Employees



Using In-house Employees To Replace Consultant Inspections

The following steps would be done for each of the categories of bridge inspections:

- Review SFY 2010 consultant invoices and identify the number of hours billed at what consultant classification and rate.
- Determine for hours billed the corresponding state employee classification and corresponding pay scale.
- Using state rates calculate payroll using consultant hours.

Add fringes

Add additives

Add indirect costs

Add non-payroll expenditures



Evaluate the Following if the Department Were to Use In-house Staff to Conduct All Bridge Inspections:

- Job specifications to determine if they are broad enough to cover the expertise/certifications/licenses needed for inspection of specialty bridges
- Existing staff to determine whether or not the existing employees possess skills for specialty bridges
- Cost of training and time to participate in training to ensure that staff maintain the expertise, certifications and licenses required
- Our ability to attract people for the specialty bridges
- For specialty bridges, will there be enough work to keep a full time employee busy and the potential for seasonal variability for all bridge inspections



Identifying Additional Equipment Needed if State Employees performed Inspections Currently being performed By Consultants

Examples of additional equipment likely needed:

Bucket trucks, vans, pick-ups, boats, scuba equipment

Large Bridges: under bridge snoopers, moogs, man lifts, barges or boats, bridge specific rigging or scaffolding transportation

Identify the costs of purchasing, renting or leasing the equipment and evaluate which procurement method would be in the best interest of the State Considerations likely to include:

Frequency of use

Does it need to be available 24/7, 365 days a year

Ability to store/maintain the equipment



Other Costs

- Space / furniture for employees and equipment
- Maintenance of equipment
- Cars
- Phones
- Computers and specialized software
- Training (i.e., perform the inspections, operate equipment)



Cost of Inspections Currently Conducted by Consultants



Determine What the Total Cost to the Department is for Inspections Currently Conducted by Consultants

Amount Paid by the Department to each of the consultants during SFY 2010

Add in Department Direct Costs (oversight costs)

Add in Department Indirect Costs

