Independent Cost Estimate (ICE)

INDEPENDENT COST ESTIMATE SUMMARY FORM

Project Name:	Downtown Loop Phase IV (Harmony Circle)
Project Number:	2023-FG-01
Date of Estimate:	11-21-2025
Description of Goods/Services:	Architectural and engineering services for replacement of streetcar track around Harmony Circle. Design services consist of conceptual design of two scenarios—1) 100% track replacement and 2) 100% track replacement with accommodations for streetcar modernization. The scope also includes preparation of 100% construction documents for emergency repairs to a portion of the Harmony Circle track. Additional design services include surveying and utility mapping, outreach assistance, cost estimating, and geotechnical analysis.

☒New Procurement

☐Contract Modification (Change Order – task order for on-call contract)

☐Exercise of Option

Method of Obtaining Estimate:

☐Published Price List (attach source and date)

☐Historical Pricing (attach copy of documentation from previous PO/Contract)

☐Comparable Purchases by Other Agencies (attach email correspondence)

☐Engineering or Technical Estimate (attach)

☐Independent Third-Party Estimate (attach)

☒Other (specify) ___**typical market value of A&E contracts in relation to capital costs**_____ attach documentation

☐Pre-established pricing resulting from competition (Contract Modification only)

Attach additional documentation such as previous pricing, documentation, emails, internet screen shots, estimates on letterhead, etc.

Summary of Method: The starting point for this estimate is the total estimated cost of construction for the Downtown Loop Phase IV/Harmony Circle project. The total cost of

construction has been calculated based on a recent Opinion of Probable Cost for a similar project—the Carrollton Double Crossover project at the other end of the St. Charles Streetcar (Carrollton and Claiborne). No similar Opinion of Probable Cost exists for the Harmony Circle project as the design will have to be advanced to a certain point in order to develop an official cost estimate for the project. Nevertheless, Carrollton Double Crossover was determined to be a comparable, similar baseline project for cost comparison purposes. As documented in the attached table, RTA applied several cost factors to the Carrollton project—accounting for additional track length, complexity, and inflation—to arrive at a preliminary hard cost estimate for the Harmony Circle track replacement project totaling $26,316,949.

To calculate the cost of basic architectural and engineering (A&E) services against this hard cost estimate, RTA used the State of Louisiana, Facilities Planning & Control (FP&C) "fee curve," which provides a rule-of-thumb percentage for A&E services in relation to hard costs. RTA applied this percentage, 6.5%, to the hard cost figure to arrive at an estimated basic design fee of $1,710,602. However, under the forthcoming task order for design services, RTA will only be advancing the design to the conceptual or 15% stage. RTA extrapolated from FP&C guidelines that a 15% design should correspond to approximately 7.5% of the total design cost. Because the consultant will be tasked with developing two scenarios at the 15% design stage, RTA calculated 7.5% * 2 * $1,710,602 to arrive at the basic design fee of $256,590.

The anticipated scope of work also includes supplemental consulting services, including geotechnical investigations, subsurface utility investigations, public outreach, and cost estimating. The methodology for calculating those services is shown on the attached table, with backup materials that provide the basis for these calculations. Cumulatively, these supplemental services total $253,905.

Adding these additional services to the basic services estimate of $256,590 yields a total estimate of $510,495, which we rounded down to $510,000.

Through the method(s) stated above, it has been determined the estimated total cost of the goods/services is $510,000.

The preceding independent cost estimate was prepared by:

Rafe Rabalais, Director of Capital Projects

Name

Signature

Harmony Circle (St. Charles Phase IV) - track replacement cost estimate

Nov-25

Capital Cost Estimate			
Carrollton Double Crossover Opinion of Probable Cost	$	3,389,208.00	Opinion prepared 11-2025; excludes cost of rail purchase
Carrollton Double Crossover - cost of rail purchase	$	2,239,388.00	Bid from Nortrak in 2019
Carrollton Double Crossover - extent of work (linear feet)		956.0	
Carrollton Double Crossover - extent of new track (linear feet)		516.0	
St. Charles Phase IV - extent of new track and work (linear feet)		2,105.0	
Ratio of St. Charles Phase IV work to Carrollton		2.2	
Ratio of St. Charles Phase IV track to Carrollton track		4.1	
Annual inflation factor for construction work		5%	
Inflation factor for rail purchase		50%	(present day vs. 2019 bid for Carrollton)
Complexity premium for St. Charles Phase IV vs. Carrollton		20%	
Estimated cost of rail purchase for St. Charles Phase IV	$	16,443,878	applied inflation factor and complexity premium and adjusted for additional length
Estimated cost of construction (other than rail) for St. Charles Phase IV	$	9,873,071	
TOTAL estimated cost of construction for St. Charles Phase IV	**$**	**26,316,949**	

Harmony Circle (St. Charles Phase IV) - A/E cost estimate

Nov-25

Total Construction Cost Estimate	$ 26,316,949			
Louisiana FP&C cost curve - A/E % of total construction cost	6.50%			
Base design cost	$ 1,710,602			
Cost of schematic design (30% design) as % of overall design cost	15%			
Cost of conceptual design (15% design) as % of overall design cost	7.50%			
Estimated cost of basic design services at 15% level * 2 design scenarios	$ 256,590			

Additional Services	**Estimated Hours**	**Hourly Rate**	**Total Cost**	**Notes**
Public Outreach	120	$ 200	$ 24,000	Estimated 20 hours of work per meeting * 2 employees * 3 public meetings
Surveying and utility mapping	n/a	n/a	$ 99,873	Average subsurface utility investigation is 1.15% of total construction cost. This was discounted by 2/3 because only a preliminary investigation will be completed during the conceptual design stage.
100% construction documents for emergency repairs	n/a	n/a	$ 48,240	Based on a recent quote for 100% construction documents for similarly small scale repairs on another streetcar line. That quote-$72,000--was discounted by a third, owing to the relative simplicity of the emergency repair work at Harmony Circle
Cost estimating	80	$ 200.00	$ 16,000	One week of work to prepare cost estimates for each of two design scenarios
Geotechnical work	n/a	n/a	$ 65,792	0.25% of total construction cost - on the low end of standard estimates given that borings should be limited in scope
TOTAL			$ 253,905	

Basic design services	$ 256,590
Additional design services	$ 253,905
TOTAL	$ 510,495

Carrollton Double Crossover Widening Project No. 2019-FG-01
Engineer's Opinion of Probable Construction Costs

IEC Project No. 20-017-01

REF. NO.	DESCRIPTION OF BID ITEMS	QUANTITY	UNIT	UNIT PRICE	UNIT PRICE EXTENSION	CONTRACTOR #1	CONTRACTOR #2	CONTRACTOR #3
1505.01	MOBILIZATION AND DEMOBILIZATION	1	LUMP SUM	$300,000.00	$ 300,000.00			
1570.01	MAINTENANCE OF TRAFFIC	1	LUMP SUM	$100,000.00	$ 100,000.00			
2202.01	REMOVAL OF SIDEWALKS, STREETCAR STOP & INCIDENTAL PAVEMENTS	260	SQUARE YARD	$186.00	$ 48,360.00			
2202.02	REMOVAL OF CONCRETE / ASPHALT ROADWAY PAVEMENTS	200	SQUARE YARD	$95.00	$ 19,000.00			
2202.03	REMOVAL OF UNKNOWN STRUCTURES AND OBSTRUCTIONS (REGARDLESS OF SIZE AND DEPTH)	75,000	DOLLAR	$1.00	$ 75,000.00			
2204.01	TEMPORARY EROSION CONTROL	1	LUMP SUM	$35,000.00	$ 35,000.00			
2303.01	CLASS II BASE COURSE OR SUBBALLAST (VEH. MEASURE)	35	CUBIC YARD	$771.50	$ 27,002.50			
2451.01	LINING, SURFACING AND TAMPING OF BALLASTED TRACK	1	LUMP SUM	$42,000.00	$ 42,000.00			
2451.02	NO. 4 BALLAST	500	TON	$312.00	$ 156,000.00			
2451.03	OAK FOUNDATION BOARDS	3624	BOARD FOOT	$15.00	$ 54,360.00			
2451.04	CONTRACTOR FURNISHED COMPOSIT TIES	100	EACH	$200.00	$ 20,000.00			
2451.05	RTA FURNISHED COMPOSIT TIES	1	LUMP SUM	$15,800.00	$ 15,800.00			
2451.06	RTA FURNISHED COMPOSIT SWITCH TIES	1	LUMP SUM	$10,000.00	$ 10,000.00			
2451.07	RTA FURNISHED BUMPING POSTS	1	LUMP SUM	$10,000.00	$ 10,000.00			
2454.01	TRACKWORK REMOVAL AND SALVAGE	1	LUMP SUM	$100,000.00	$ 100,000.00			
2454.02	RTA FURNISHED DOUBLE CROSSOVER INCLUDING CONNECTING TRACK SECTIONS	1	LUMP SUM	$50,000.00	$ 50,000.00			
2454.03	BALLASTED TRACK DOUBLE CROSSOVER INCLUDING CONNECTING TRACK SECTIONS	1	LUMP SUM	$200,000.00	$ 200,000.00			
2454.04	MODIFICATIONS TO EXISTING S-CURVE TRACK	1	LUMP SUM	$30,000.00	$ 30,000.00			
2457.01	RAIL WELDING	16	EACH	$1,500.00	$ 24,000.00			
2459.01	500KCMIL AWG POWER BOND CABLE (NEGATIVE TRACTION RETURN JUMPERS)	1	LUMP SUM	$120,000.00	$ 120,000.00			
2601.01	FULL DEPTH SAW CUTTING OF CONCRETE PAVEMENTS	380	LINEAR FOOT	$25.00	$ 9,500.00			
2601.02	9" PORTLAND CEMENT CONCRETE ROADWAY PAVEMENT	200	SQUARE YARD	$315.00	$ 63,000.00			
2615.01	STREETCAR STATION TACTILE / DETECTABLE TILES	140	LINEAR FOOT	$140.00	$ 19,600.00			
2701.01	4"AND 6" PVC TRACK SWITCH MACHINE DRAINAGE	1	LUMP SUM	$17,850.00	$ 17,850.00			
2701.02	REMOVE AND REPLACE 12" CPET BALLAST DRAIN PIPE	1	LUMP SUM	$15,000.00	$ 15,000.00			
2706.01	6" CONCRETE STREETCAR STOP, SIDEWALKS, SWITCH, AND U-TURN IMPROVEMENT PAVEMENTS	440	SQUARE YARD	$280.00	$ 123,200.00			
17201.01	TEMPORARY TERMINATION AND SELECTIVE REMOVAL OF OCS	1	LUMP SUM	$140,000.00	$ 140,000.00			
17201.02	REMOVAL OF OCS POLES AND FOUNDATIONS	4	EACH	$30,000.00	$ 120,000.00			
17201.03	OVERHEAD CONTACT SYSTEM (OCS)	1	LUMP SUM	$225,000.00	$ 225,000.00			
17215.01	OCS FOUNDATION (3" DIAMETER)	5	EACH	$75,000.00	$ 375,000.00			
17221.01	OCS POLES (10" DIAMETER)	2	EACH	$29,000.00	$ 58,000.00			
17221.02	OCS POLES (SALVAGE)	3	EACH	$20,000.00	$ 60,000.00			
17222.01	PAINTING NEW AND EXISTING OCS POLES (8" & 10" DIAMETER), CANTILEVER ARMS, BRACKETS AND BRACES	1	LUMP SUM	$55,000.00	$ 55,000.00			
17291.01	OCS TESTING, TRAINING, AND MANUALS	1	LUMP SUM	$125,000.00	$ 125,000.00			
17311.01	POWER AND SPRING SWITCH MACHINES (INCLUDING TESTING AND TRAINING)	1	LUMP SUM	$150,000.00	$ 150,000.00			
17325.01	TRAIN CONTROL CIRCUITS AND CONTROLLERS	1	LUMP SUM	$300,000.00	$ 300,000.00			
01-56-39	TREE PROTECTION AND TREATMENT	548	LINEAR FOOT	$136.50	$ 74,802.00			
32-92-23	SLAB SODDING	2110	SQUARE YARD	$10.30	$ 21,733.00			
			SUB TOTAL		$ 3,389,207.50			
			20% CONTINGENCY		$ 677,841.50			
			TOTAL		$ 4,067,049.00			

State of Louisiana
Facility Planning & Control

BCI & CPI
FOR
2025 Fee Formula

BCI		CPI
1306	1975	53.8
8345	2024	313.7

SCHEDULE OF REPRESENTATIVE FEES
FOR
2025

AFC	Fee as a Percentage of AFC	Fee
$ 10,000.00	13.1700%	$ 1,317.00
$ 50,000.00	10.8040%	$ 5,402.00
$ 100,000.00	10.0290%	$ 10,029.00
$ 200,000.00	9.3575%	$ 18,715.00
$ 500,000.00	8.5966%	$ 42,983.00
$ 750,000.00	8.2981%	$ 62,236.00
$ 1,000,000.00	8.0985%	$ 80,985.00
$ 1,500,000.00	7.8330%	$ 117,495.00
$ 2,000,000.00	7.6549%	$ 153,098.00
$ 3,500,000.00	7.3307%	$ 256,574.00
$ 5,000,000.00	7.1380%	$ 356,901.00
$ 7,500,000.00	6.9309%	$ 519,820.00
$ 10,000,000.00	6.7911%	$ 679,114.00
$ 20,000,000.00	6.4764%	$ 1,295,282.00
$ 50,000,000.00	6.1025%	$ 3,051,273.00

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Subpart 3. Equipment-Lease Purchase Program

Part III. Facility Planning and Control

for designer's selection, for each calendar day past the original or extended date that the designer has not delivered all construction documents to the owner sufficiently complete, coordinated and ready to bid. Completeness of the construction document phase will be determined by the owner as described in §111.A.2.

AUTHORITY NOTE: Promulgated in accordance with R.S. 39:1410.

HISTORICAL NOTE: Promulgated by the Office of the Governor, Division of Administration, Facility Planning and Control, LR 8:474 (September 1982), amended LR 11:850 (September 1985), LR 31:1077 (May 2005), LR 32:2047 (November 2006), LR 46:1568 (November 2020).

§111. Payments to the Designer

A. Payments on account of designer's services shall be made as follows.

1. Basic Services

a. Upon satisfactory completion of all basic services for each phase, submission of all documents to the owner and upon the owner's and user's approval of same, which approval shall not be arbitrarily withheld, payment for the following phases of the designer's services will be made in one lump sum (with the exception of the construction documents phase as described below in Paragraph 2); such payments shall be up to the following percentages of the designer's fixed fee, either interim or final, as applicable, which percentages are cumulative.

estimated 15% design to be 7.5%

Program completion phase	5 percent
Schematic design phase (30%)	15 percent
Design development phase	35 percent
Construction documents phase	60 percent
Bidding and contract phase	65 percent

b. Monthly in proportion to the contractor's certificate for payment for the following phase: Construction phase—95 percent.

c. Upon satisfactory completion and furnishing required documents to the owner for the following phase: Construction close-out phase—100 percent.

i. One percent of the designer's fee up to $2,000 maximum may be withheld from construction close-out payment until completion of the one-year warranty inspection period.

2. A partial payment for the construction documents phase shall be made when the designer has completed 100 percent of the construction documents and has submitted these to the owner, the user agency, and the other required statutory agencies and the owner determines by inventory check and conformity that all required documents have been submitted, and are sufficiently complete, coordinated and ready to bid, then the designer shall be entitled to a payment of 80 percent of the fee for the construction documents phase. Should the owner's approval of the construction documents not be issued within 45 days of submittal due to no fault of the designer, then the designer shall be paid an additional payment of 10 percent of the fee for the construction documents phase. The balance of the fee for this phase will be due upon the completion of review by owner and user, when corrections have been made, and a complete set of bid documents are submitted to the owner. For projects with an AFC over $10 million, interim payments up to 50 percent of the fee for the construction document phase may be made by agreement between the owner and the designer.

3. If any phase or phase payment is delayed through no fault of the designer, the owner and designer may negotiate a partial payment.

4. The designer shall promptly pay consultants. By signing the professional design services invoice, the designer agrees that all consultants will be promptly paid those amounts due them out of the amount paid to the designer within 45 days. Upon receipt of reasonable evidence of the designer's failure to pay consultants' amounts due them, the owner may withhold all or part of the designer's payment until the owner is satisfied that any amounts owed have been paid or otherwise settled.

B. Payments on account of designer's additional services and for reimbursable expenses shall be made on submission of designer's invoices with supporting data, and their written approval by owner and user agency and issuance of an amendment to the contract covering such services.

C. Payments to the designer on termination, abandonment or suspension shall be made in accordance with §§117 and 119, hereinafter.

AUTHORITY NOTE: Promulgated in accordance with R.S. 39:1410.

HISTORICAL NOTE: Promulgated by the Office of the Governor, Division of Administration, Facility Planning and Control, LR 8:474 (September 1982), amended LR 11:851 (September 1985), LR 13:656 (November 1987), LR 31:1078 (May 2005), LR 46:1569 (November 2020).

§115. Designer's Accounting Records

A. Records of direct reimbursable expenses and expenses pertaining to additional services on the project, and for services performed on the basis of multiplier times direct personnel expense, shall be kept on the basis of generally accepted accounting principles and shall be furnished and/or made available to the owner or the owner's authorized representative on request.

AUTHORITY NOTE: Promulgated in accordance with R.S. 39:1410.

HISTORICAL NOTE: Promulgated by the Office of the Governor, Division of Administration, Facility Planning and Control, LR 8:477 (September 1982), amended LR 11:854 (September 1985), LR 46:1569 (November 2020).

§117. Termination of Contract

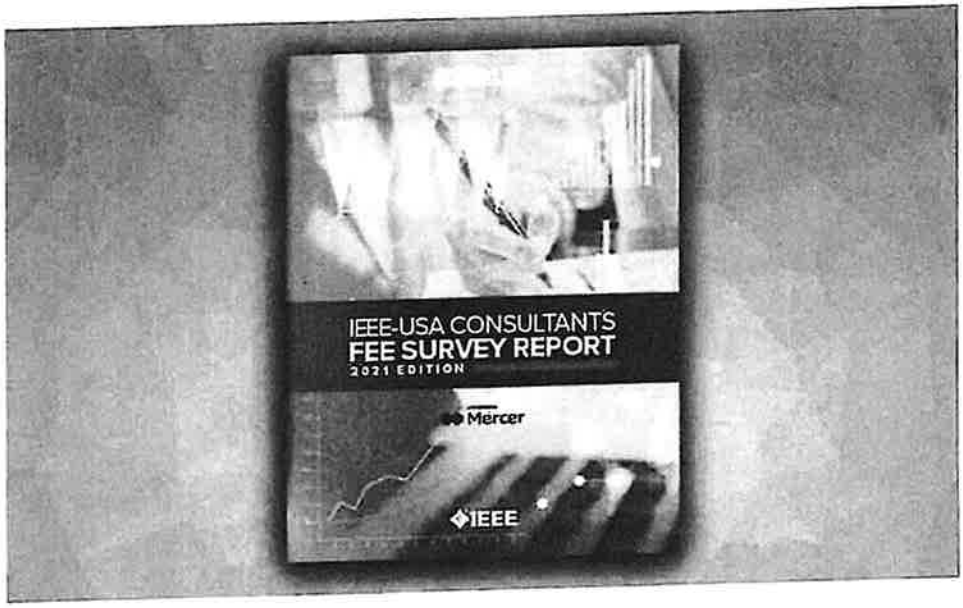
A. The contract between owner and designer may be terminated by either party upon 30 days' written notice to the other party, should said other party fail to perform in accordance with its terms, through no fault of the terminating party, or the contract may be terminated by mutual consent.

B. In the event of termination by the owner due to failure of the designer to perform satisfactorily, the designer shall receive no compensation beyond that already paid or due for

2021 IEEE-USA Consultants Fee Survey Report – Median Billable Rates Up, Covid Affecting Short- and Long-Term Business

By Paul Lief Rosengren

19 October 2021 0 5,772 3 minutes read



IEEE-USA Consultants Fee Survey Report – 2021 Edition

MORE INFO

IEEE-USA has released its 2021 Consultants Fee Survey, focusing on the compensation of consultants, as well as on the impact of COVID-19 on members who earn at least half of their income from engineering consulting. Starting in 1998, this survey has been conducted every other year — through 2008; and annually, starting in 2009.

Despite COVID-19, there was a rise in the amount that respondents to the survey were billing as consultants. The average consultant billing was $170 per hour, up $20 over the previous survey. This rate was consistent, regardless of years of experience — except for those with less than 15 years of experience, whose median hourly rate was $158 an hour. The share of respondents with hourly rates at, or above, $200 per hour increased to 36.4%, up from 32.1% in 2020.

Educational differences in billing rates were consistent with the 2020 survey. Having a Ph.D. translated into a $45 higher median billing rate ($215 an hour), with 17.5% of respondents holding a Ph.D., or its equivalent. There is virtually no difference in hourly rate between those with a

CPI Inflation Calculator

CPI Inflation Calculator

$ 170.00

in year1 month May ▾ year1 year 2021 ▾

has the same buying power as

$203.01

in year2 month May ▾ year2 year 2025 ▾

Calculate

adjusted for inflation to $203/hr.

About the CPI Inflation Calculator

The CPI inflation calculator uses the Consumer Price Index for All Urban Consumers (CPI-U) U.S. city average series for all items, not seasonally adjusted. This data represents changes in the prices of all goods and services purchased for consumption by urban households.

U.S. BUREAU OF LABOR STATISTICS Office of Publications and Special Studies Suitland Federal Center Floor 7 4600 Silver Hill Road Washington, DC 20212-0002

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Between the Poles

March 16, 2020

Large ROI from subsurface utility engineering (SUE) for highway construction projects

Return on investment (ROI) studies of subsurface engineering utility engineering (SUE) surveys applied to highway construction projects conducted since the late 1990s have consistently revealed a large return-on-investment from conducting SUE surveys as part of highway construction projects.

One of the first in 1999 by Purdue University and sponsored by the US DOT Federal Highway Administration (FHWA) identified 21 categories of cost savings that could result from including a subsurface utility engineering (SUE) survey in construction projects. Only some of these could be quantified and it was estimated that the qualitative benefits exceeded those that could be quantified. It was estimated that SUE surveys resulted in a construction savings of at least 1.9 percent over the traditional approach of relying on as-builts and (above-ground) site surveys for identifying underground utilities. Using the national expenditure in 1998 of $51 billion for highway construction (FHWA), it was calculated that requiring SUE on road construction projects could result in a national savings of at least $1 billion per year.

A subsequent reanalysis of the same Purdue data estimated that the ROI was $12.23 for every $1 spent on SUE. Furthermore the cost of conducting a SUE survey was estimated at 1.39% of total project costs. In 2007 a study for PennDOT and USDOT found an ROI of 22.21 : 1.

The most recent ROI analysis sponsored by PennDOT differed from previous analyses by including both SUE and non-SUE projects. It calculated an ROI of 11.39 : 1. The largest contributor to the cost savings attributed to SUE was a 40.33% reduction in utility relocation costs. Utility relocations were avoided or reduced by providing engineers/designers with accurate underground information in the early stages of design. The second largest savings was 29.46% in reduced construction and design costs. SUE enables designers to design efficiently and accurately with reliable information, so that design time can be saved and unnecessary construction work can be avoided or reduced. The cost of conducting a SUE survey was estimated to be 1.65% of project cost.

These ROI studies show that SUE can provide accurate utility information with important project benefits at reasonable cost.

Year	ROI	Cost of SUE (% of project cost)	Description	Sponsoring agency	Source
2012	11.39:1	1.65%	Study of 22 SUE and 8 non-SUE projects	PennDOT	Yeun J. Jung, Evaluation of subsurface utility engineering for highway projects: Benefit–cost analysis, pages 111-122 in Tunnelling and Underground Space Technology Volume 27, Issue 1 Pages 1-168 (January 2012)
2012	16:1		Study of one SUE project	Region of Lombardy	

would have been avoided by SUE can be considered as SUE benefits. The results of the study revealed that $11.39 can be saved for every $1 spent on SUE on road projects.

The top cost savings that were found are as follows:

1. 40.33% reduction in project relocation cost by providing accurate underground information in the early stages of design
2. 29.46% reduction in construction and design costs - SUE enables designers to design efficiently and accurately with reliable information, so that design time can be saved and unnecessary construction work can be avoided or reduced.
3. 9.59% reduction in redesign costs
4. 9.08% reduction in delay costs due to relocation
5. 6.81% reduction in delay costs caused by emergencies
6. 1.41% reduction in delay costs caused by unexpected utilities
7. 1.41% reduction in information gathering and verification cost
8. 1.04% reduction in restoration cost

It was concluded that SUE can provide accurate utility information with important project benefits at reasonable cost. A ratio of 1.65% was determined as the ratio of SUE cost to total project cost. The study also showed that the greater the complexity level of buried utilities, the higher the SUE benefits.

Region of Lombardy, Italy 2012

A pilot project was undertaken to map all underground infrastructure on the site of Expo Milano in preparation for the 2015 event in Milan. All underground infrastructure in the project area (230 000 square meters) including electric power, water, sewers, gas, district heating, street lighting, and telecommunication were mapped by combining historical records and IDS GeoRadar ground penetrating radar (GPR) technology. A key objective of the project was an economic analysis of the costs and benefits of applying GPR to detect the location of underground infrastructure. The analysis estimated that the return on investment is about €16 for every euro invested in improving the reliability of information about underground infrastructure. The analysis emphasized that there were other important, but non-quantifiable, benefits including better safety for both workers and the public as well as fewer traffic disruptions.

Pennsylvania Department of Transportation 2007

This study conducted by Penn State and sponsored by the Pennsylvania Department of Transportation PennDOT) and the U.S. DoT, Federal Highway Administration (FHWA) performed a benefit-cost analysis of 10 SUE highway projects from different PennDOT districts. The case studies were investigated by conducting interviews with utility engineers, SUE consultants, and project engineers. Site visits, analyses of project data, and detailed individual studies of the 10 SUE highway projects were also performed for this research. These projects were selected randomly from a list of projects that utilized SUE quality level A and/or B. The projects investigated in this study involved road construction and bridge replacement in urban, suburban, and rural areas. PennDOT project managers and engineers, utility owners, SUE consultants, designers, and contractors were interviewed. A savings of $22.21 for every $1.00 spent on SUE was estimated based on the analysis of the 10 projects. These projects had a total project cost (including both design and construction cost) in excess of $120 million. The costs of conducting SUE (to ASCE QL A or B) on these 10 projects were less than 0.6 percent of the total project costs. The benefit was cost savings of 15% over traditional approach relying on ASCE QL C and D utility data.

Project costs ranged from $2 million to $63 million. The quality of the utility records for these projects was poor or fair. The cost of conducting SUE ranged from $20,000 to $141,000 for these projects. The ratio of SUE cost to the total project cost ranged from 0.22% to 2.8%, with an average of 1.15%. SUE resulted in cost savings ranging from $65,000 to $4.5 million. The benefit-cost ratio ranged from 3.25 to 33.93, with an average of 22.21. In other words $22.21 can be saved for every $1 spent on SUE. The costs of conducting SUE on these 10 projects were less than 0.6 percent of the total project cost. Furthermore the analysis revealed a strong relationship between benefit of SUE and utility complexity. The benefit derived from performing a SUE survey increases as the underground utility complexity increases.

Ontario Sewer and Watermain Contractors Association 2004

In 2004 in Canada, the Ontario Sewer and Watermain Contractors Association commissioned the University of Toronto to investigate the practice of using SUE on large infrastructure projects in Ontario. Osman and El-Diraby (2005) analyzed nine

Purchase Order RTAP_01716

Supplier Details:

Company	INFINITY ENGINEERING CONSULTANTS
Contact	
Address	4001 DIVISION STREET METAIRIE, LA 70002

Submit your response to:

Company	Regional Transit Authority
Contact	Leah LeBlanc
Address	2817 Canal Street NEW ORLEANS, LA 70119
Phone	
Fax	
E-mail	lmccraw@rtaforward.org

This agreement between Regional Transit Authority and INFINITY ENGINEERING CONSULTANTS is authorized for binding commitment. The parties hereto have read and executed this agreement as of Wednesday, August 13, 2025.

P.O. for preparation of 100% construction documents for limited repairs to the Rampart / Loyola streetcar

Purchase Order RTAP_01716

Order	RTAP_01716
Order Date	13-AUG-2025
Change Order	0
Change Order Date	13-AUG-2025
Revision	0
Ordered	72,000.00 USD

Sold To **Regional Transit Authority**
2817 Canal Street
NEW ORLEANS, LA 70119

Supplier **INFINITY ENGINEERING CONSULTANTS**
4001 DIVISION STREET
METAIRIE, LA 70002

Bill To **RTABU**
2817 Canal Street
NEW ORLEANS, LA 70119
UNITED STATES

Ship To **Attn: Accounts Payable**
2817 CANAL STREET
NEW ORLEANS, LA 70119
UNITED STATES

Notes USD = US Dollar

Customer Account Number	Supplier Number	Payment Terms	Freight Terms	FOB	Shipping Method
	5925392	Net 30			

Confirm To	Deliver To Contact
Leah LeBlanc	**Adolph Bynum Jr.** E-mail**abynumjr@rtaforward.org**

Line	Item	Price	Quantity	UOM	Ordered	Taxable
1	Rampart/Loyola Streetcar Electrical Feeder Replacement RTP #2025-01-FG-01 (see attachment)	72,000.00		USD		
		Promised	1	USD	72,000.00	
		Requested 7/30/25				

Requested and Promised Dates correspond to the date of arrival at the Ship-to Location.

Line Total	**72,000.00**
Total	**72,000.00**

Managing Geotechnical Risks in Design–Build Projects (2018)

DETAILS

279 pages | 8.5 x 11 | PAPERBACK

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CONTRIBUTORS

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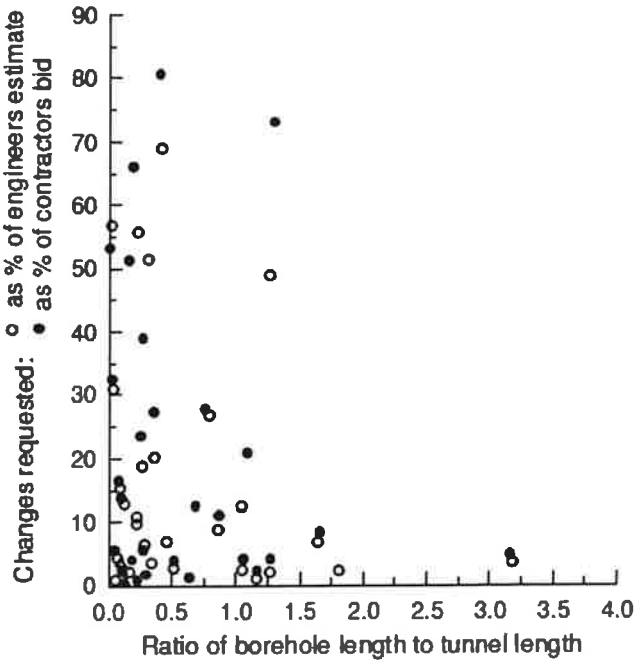

Figure A. 1 - Changes vs ratio of borehole length to tunnel length (Hoek and Palmeiri 1998)

Cost of geotechnical investigation

Needless to say, the extent of geotechnical investigation should be considered *vis-a-vis* the cost of this effort. While data on the cost of geotechnical investigations is scarce for DB projects, there are some suggestions for projects regardless of delivery method. Smith (1996) estimates the cost of ground investigation at less than 1% of construction costs. Van Staveren (2006) reports on several authors that estimate this cost to be in the range of 0.1% to 1%. The US Subcommittee on Geotechnical Site Investigations suggested a ground investigation budget of around 2% of total costs in order to keep the final cost within a margin of ±10% in tunneling projects. Clayton (2001) describes a study by Mott McDonald and Soil Mechanics Ltd (1994) that reported on the cost overruns as a function of expenditure on site investigation for UK highway projects (Figure A. 2). According to Clayton, less than 1% of project costs is expensed on ground investigations and it is

evident that spending more upfront helps to reduce the final cost of the project. The research effort concluded that the 1% level was often not sufficient to prevent large cost overruns in British highway projects.

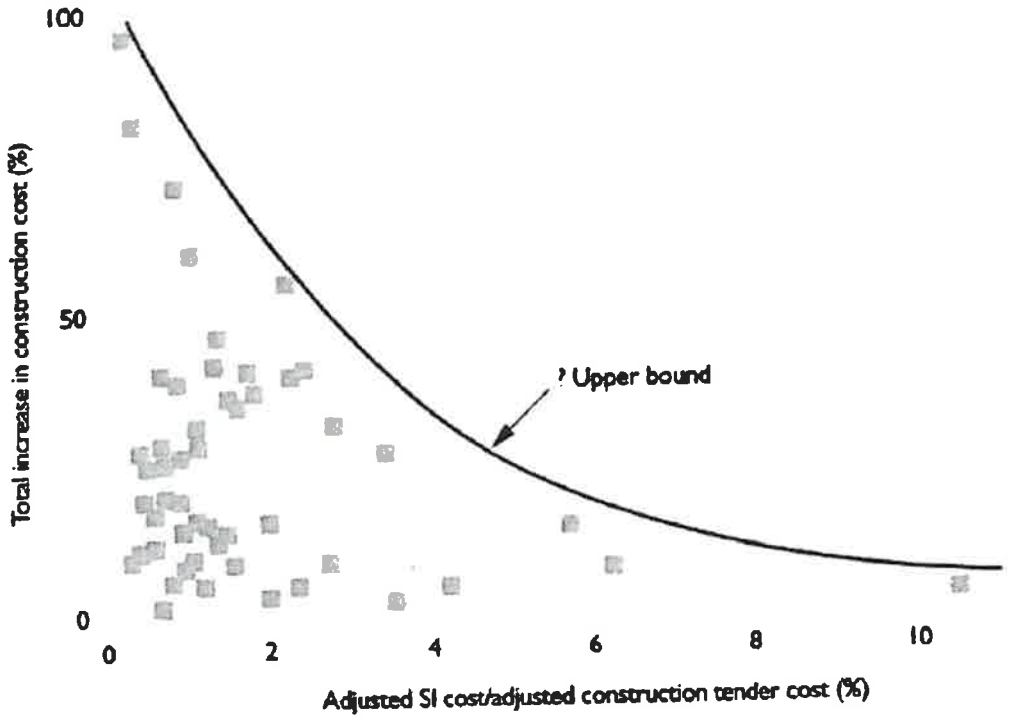

Figure A. 2 - Cost overrun vs site investigation expenditures (Mott McDonald & Soil Mechanics Ltd 1994)

The research team interviewed nine state DOTs and collected data on the cost of geotechnical investigations for 11 DB projects. The range was reported to be between 0.25% to 0.5% of total project budget. Mostly, these efforts resulted in preparation of the Geotechnical Data Report (GDR) which contains the test data without detailed interpretation. Probably more important was the time impact. Duration of investigations varied between six months to 1.5 years depending on the size and scope of the project and the level of effort. A more detailed description of these interviews is provided in this Appendix C of the report.