

# MEMORANDUM TO THE BOARD



**TO:** Utah Transit Authority Board of Trustees  
**THROUGH:** Carolyn Gonot, Executive Director  
**FROM:** Mary DeLoretto, Acting Chief Service Development Officer  
**PRESENTER(S):** Mary DeLoretto, Acting Chief Service Development Officer

**BOARD MEETING DATE:** January 29, 2020

<b>SUBJECT:</b>	<b>Future of Light Rail Study (LTK Engineering Services, Inc.)</b>
<b>AGENDA ITEM TYPE:</b>	<b>Expense Contract</b>
<b>RECOMMENDATION:</b>	Approve award and authorize Executive Director to execute the contract with LTK Engineering Services for the Future of Light Rail Study in the amount of \$399,673
<b>BACKGROUND:</b>	<p>UTA’s Light Rail Network, which just celebrated its 20 year anniversary, has become a backbone of UTA’s transit system, carrying over 60,000 riders per day, complementing the regional vision, while shaping a more centered-based development pattern. Although TRAX and Streetcar have been very successful, the light rail system must adapt to a growing region and evolving travel patterns to retain and improve its vital function in the transportation network. Over the years, a range of projects have been considered to optimize the operational efficiency of the network and expand where necessary. However, all of these elements have not been examined holistically from a cost/benefits perspective. A comprehensive analysis of UTA’s light rail network is needed to determine which improvements UTA should pursue in both the near and long term.</p>
<b>DISCUSSION:</b>	<p>The Future of Light Rail Study will analyze and recommend service, operational, and capital improvements to the regional light rail network, including TRAX and Streetcar, to optimize its existing function and accommodate future growth. The study will evaluate a range of possibilities related to fleet modifications, headways and span of service, alignments of track extensions, potential station locations, considering projects identified in regional transportation plans and other potential enhancements. An evaluation of costs and benefits for each potential improvement will inform the analysis. Ultimately, the study will recommend: 1) a phased approach to implementing realistic incremental enhancements that will meet immediate needs and optimize operational efficiencies and 2) capital improvements that increase capacity to accommodate future growth and 3) propose a draft light rail system plan.</p> <p>A competitive, qualifications-based procurement process was conducted, and two proposals were received. After thorough review, LTK, who specializes in rail systems and has experience developing similar light rail strategic plans was selected for the study.</p>

<b>CONTRACT SUMMARY:</b>	Contractor Name: LTK Engineering Services	
	Contract Number: 19-3139TP	Existing Contract Value: \$399,673 (Phase 1- \$182,948, Phase 2- \$216,725)
	Base Contract Effective Dates: January 29, 2020 – January 31, 2022	
	Procurement Method: Qualifications-based (Brooks Act method)	Funding Source: UTA Planning Department Budget
<b>ALTERNATIVES:</b>	Without the Future of Light Rail Study, it would be difficult for UTA to analyze the entire light rail network and plan for enhancing the system to accommodate regional growth. In some cases, projects could be considered in isolation without considering the collective benefit of a range of improvements. Some benefits would be considered for potential extensions as part of the Regional Transportation Planning Process, but the detail of the analysis would be limited.	
<b>FISCAL IMPACT:</b>	The Total Contract is for \$399,673, with \$182,948 budgeted for Phase 1 and \$216,725 for Phase 2 of the Study. UTA has the option to move forward or terminate the contract upon completion of Phase 1. The UTA Planning Department has budgeted \$200,000 in 2020 to complete Phase 1 of the Study.	
<b>ATTACHMENTS:</b>	Contract	

**PROFESSIONAL SERVICES AGREEMENT**

**Future of Light Rail Study**

This Professional Services Agreement is entered into and made effective as of the latest signature date below, (the "Effective Date") by and between UTAH TRANSIT AUTHORITY, a public transit district organized under the laws of the State of Utah ("UTA"), and LTK ENGINEERING SERVICES, with a place of business at 100 West Butler Avenue, Ambler, PA 19002 ("Consultant").

RECITALS

- A. UTA desires to hire professional services for the Future of Light Rail Study.
- B. On October 14, 2019, UTA issued Request for Qualifications Package Number 19-03139TP ("RFQu") encouraging interested parties to submit Statement of Qualifications to perform the services described in the RFQu.
- C. Upon evaluation of the proposals submitted in response to the RFQu, UTA selected Consultant as the preferred entity with whom to negotiate a contract to perform the Work.
- D. Consultant is qualified and willing to perform the Work as set forth in the in Exhibit "A" Scope of Work and Pricing, as subject to the Assumptions found in Exhibit "A."

AGREEMENT

NOW, THEREFORE, in accordance with the foregoing Recitals, which are incorporated herein by reference, and for and in consideration of the mutual covenants and agreements hereafter set forth, the mutual benefits to the parties to be derived herefrom, and for other valuable consideration, the receipt and sufficiency of which the parties acknowledge, it is hereby agreed as follows:

**ARTICLE 1.0**

**Definitions**

As used throughout this Contract, the following terms shall have the meanings set forth below:

- 1.1 The term "Change Order" shall mean a written modification to this Contract (the form of which shall be prescribed by UTA) pursuant to which the parties shall mutually agree upon and effect any additions, deletions, or variations in the Work (as such Work is initially defined by this Contract). The scope of modifications may include, without limitation, changes in the: (i) consideration paid to Consultant, (ii) deliverables required to be furnished by Consultant; (iii) method, manner or scope of the Work; or (iv) required performance completion milestones or other Contract schedule requirements.
- 1.2 The term "Claims" shall have the meaning set forth in Section 16.1 of this Contract.
- 1.3 The term "Consultant's Project Manager" shall mean Bill Lipfert, or his/her successor as appointed or designated in writing by Consultant.
- 1.4 The term "Consultant's Statement of Qualification" shall mean LTK Engineering Services Future of Light Rail Study dated November 11, 2019.
- 1.5 The term "Contract" shall mean this Professional Services Agreement (inclusive of amendments and Change Orders hereto), together with all attached exhibits, all documents incorporated by reference pursuant to Article 26 hereof, and all drawings, reports, studies, industry standards, legal requirements and other items referenced in the foregoing documents.

- 16 The term "Indemnitees" shall mean the UTA parties set forth in Section 16.1 of this Contract.
- 17 The term "Scope of Services" shall mean the services described in or reasonably implied by this Contract including, but not limited to, Exhibit "A," as subject to the Assumptions found therein (and all Contract requirements associated with such services).
- 18 The term "UTA's Project Manager" shall mean Levi Roberts or his/her successor as appointed or designated in writing by UTA.
- 19 The term "Work" shall mean any activities undertaken or required to be undertaken by Consultant in conjunction with the Scope of Services or Contract.
- 1.10 The Order of Precedence for this contract is as follows:

1. UTA Contract Terms
2. UTA Solicitation Terms
3. UTA Project Specifications
4. Contractor's Bid or Proposal
5. Contractor proposed terms or conditions

Any contractor proposed term or condition which is in conflict with a UTA contract or solicitation term or condition will be deemed null and void.

#### **ARTICLE 2.0 Description of Services**

- 2.1 Consultant shall perform all Work as set forth in the Scope of Services. Except for items (if any) which this Contract specifically states will be UTA-provided, Consultant shall furnish all the labor, material and incidentals necessary for the Work.
- 2.2 Consultant shall perform all Work under this Contract in a professional manner, using at least that standard of care, skill and judgment which can reasonably be expected from similarly situated professionals.
- 2.3 All Work shall conform to generally accepted standards in the transit industry. Consultant shall perform all Work in compliance with applicable laws, regulations, rules, ordinances, permit constraints and other legal requirements including, without limitation, those related to safety and environmental protection.
- 2.4 Consultant shall furnish only qualified personnel and materials necessary for the performance of the Work.
- 2.5 When performing Work on UTA property, Consultant shall comply with all UTA work site rules including, without limitation, those related to safety and environmental protection.

#### **ARTICLE 3.0 Day-to-Day Management of the Work**

- 3.1 Consultant's Project Manager will be the day-to-day contact person for Consultant and will be responsible for all Work, as well as the coordination of such Work with UTA.
- 3.2 UTA's Project Manager will be the day-to-day contact person for UTA, and shall act as the liaison between UTA and Consultant with respect to the Work. UTA's Project Manager shall also coordinate any design reviews, approvals or other direction required from UTA with respect to the Work.

#### **ARTICLE 4.0 Progress of the Work**

- 4.1 Consultant shall prosecute the Work in a diligent and continuous manner and in accordance with

all applicable notice to proceed, critical path schedule and guaranteed completion date requirements set forth in (or developed and agreed by the parties in accordance with) the Scope of Services.

- 4.2 Consultant shall conduct regular meetings to update UTA's Project Manager regarding the progress of the Work including, but not limited to, any unusual conditions or critical path schedule items that could affect or delay the Work. Such meetings shall be held at intervals mutually agreed to between the parties.
- 4.3 Consultant shall deliver monthly progress reports and provide all Contract submittals and other deliverables as specified in the Scope of Services.
- 4.4 Any drawing or other submittal reviews to be performed by UTA in accordance with the Scope of Services are for the sole benefit of UTA, and shall not relieve Consultant of its responsibility to comply with the Contract requirements.
- 4.5 UTA will have the right to inspect, monitor and review any Work performed by Consultant hereunder as deemed necessary by UTA to verify that such Work conforms to the Contract requirements. Any such inspection, monitoring and review performed by UTA is for the sole benefit of UTA, and shall not relieve Consultant of its responsibility to comply with the Contract requirements.
- 4.6 UTA shall have the right to reject Work which fails to conform to the requirements of this Contract. Upon receipt of notice of rejection from UTA, Consultant shall (at its sole expense and without entitlement to equitable schedule relief) upon reasonable written notice promptly re-perform, replace or re-execute the Work so as to conform to the Contract requirements.
- 4.7 If Consultant fails to promptly remedy rejected Work as provided in Section 4.6, UTA may (without limiting or waiving any rights or remedies it may have) perform necessary corrective action using other contractors or UTA's own forces. Any costs reasonably incurred by UTA in such corrective action shall be chargeable to Consultant.

#### **ARTICLE 5.0**

##### **Period of Performance**

- 5.1 This Contract shall commence as of the Effective Date. This Contract shall remain in full force and effect for a 24 month period expiring January 31, 2022. Phase 1 will be for 12 months with up to 6 months to review Phase 1 results. UTA will then have an option to move forward with Phase 2 for up to 6-12 additional months. This Contract may be further extended if the Consultant and UTA mutually agree to an extension evidenced in writing. The rights and obligations of UTA and Consultant under this Contract shall at all times be subject to and conditioned upon the provisions of this Contract.

#### **ARTICLE 6.0**

##### **Consideration**

- 6.1 For the performance of the Work, UTA shall pay Consultant in accordance with Exhibit B. Payments shall be made in accordance with the milestones or other payment provisions detailed in Exhibit B. If Exhibit B does not specify any milestones or other payment provisions, then payment shall be made upon completion of all Work and final acceptance thereof by UTA.
- 6.2 To the extent that Exhibit B or another provision of this Contract calls for any portion of the consideration to be paid on a cost-reimbursement basis, such costs shall only be reimbursable to the extent allowed under 2 CFR Part 200 Subpart E. Compliance with federal cost principles shall apply regardless of funding source for this contract.
- 6.3 To the extent that Exhibit B or another provision of this Contract calls for any portion of the consideration to be paid on a time and materials or labor hour basis, then Consultant must refer

to the not-to-exceed amount, maximum Contract amount, Contract budget amount or similar designation (any of these generically referred to as the "Not to Exceed Amount") specified in Exhibit B (as applicable). Unless and until UTA has notified Consultant by written instrument designated or indicated to be a Change Order that the Not to Exceed Amount has been increased (which notice shall specify a revised Not to Exceed Amount): (i) Consultant shall not be obligated to perform services or incur costs which would cause its total compensation under this Contract to exceed the Not to Exceed Amount; and (ii) UTA shall not be obligated to make payments which would cause the total compensation paid to Consultant to exceed the Not to Exceed Amount.

- 6.4 UTA may withhold and/or offset from payment any amounts reasonably reflecting: (i) items of Work that have been rejected by UTA in accordance with this Contract; (ii) invoiced items that are not payable under this Contract; or (iii) amounts Consultant owes to UTA under this Contract.

#### **ARTICLE 7.0 Contract Changes**

- 7.1 UTA's Project Manager or designee may, at anytime, by written order designated or indicated to be a Change Order, direct changes in the Work including, but not limited to, changes:
- A. In the Scope of Services;
  - B. In the method or manner of performance of the Work; or
  - C. In the schedule or completion dates applicable to the Work.

To the extent that any change in Work directed by UTA causes an actual and demonstrable impact to: (i) Consultant's cost of performing the work; or (ii) the time required for the Work, then (in either case) the Change Order shall include an equitable adjustment to this Contract to make Consultant whole with respect to the impacts of such change.

- 7.2 A change in the Work may only be directed by UTA through a written Change Order or (alternatively) UTA's expressed, written authorization directing Consultant to proceed pending negotiation of a Change Order. Any changes to this Contract undertaken by Consultant without such written authority shall be at Consultant's sole risk. Consultant shall not be entitled to rely on any other manner or method of direction.
- 7.3 Consultant shall also be entitled to an equitable adjustment to address the actual and demonstrable impacts of "constructive" changes in the Work if: (i) subsequent to the Effective Date of this Contract, there is a material change with respect to any law or other requirement set forth in this Contract; or (ii) other conditions exist which materially modify the magnitude, character or complexity of the Work from what should have been reasonably assumed by Consultant based on the information included in (or referenced by) this Contract. In order to be eligible for equitable relief for "constructive" changes in Work, Consultant must give UTA's Project Manager or designee written notice stating:
- A. The date, circumstances, and source of the change; and
  - B. That Consultant regards the identified item as a change in Work giving rise to an adjustment in this Contract. Consultant must provide notice of a "constructive" change and assert its right to an equitable adjustment under this Section within ten (10) days after Consultant becomes aware (or reasonably should have become aware) of the facts and circumstances giving rise to the "constructive" change. Consultant's failure to provide timely written notice as provided above shall constitute a waiver of Consultant's rights with respect to such claim.
- 7.4 As soon as practicable, Consultant must provide UTA with information and documentation

reasonably demonstrating the actual cost and schedule impacts associated with any change in Work compensable under Section 7.1 or 7.3. Equitable adjustments will be made via Change Order. Any dispute regarding the Consultant's entitlement to an equitable adjustment (or the extent of any such equitable adjustment) shall be resolved in accordance with Article 20 of this Contract.

## **ARTICLE 8.0**

### **Invoicing Procedures and Records**

- 8.1 Consultant shall submit invoices to UTA's Project Manager for processing and payment in accordance with Exhibit B. If Exhibit B does not specify invoice instructions, then Consultant shall invoice UTA after completion of all Work and final acceptance thereof by UTA. Invoices shall be provided in the form specified by UTA. Reasonable supporting documentation demonstrating Consultant's entitlement to the requested payment must be submitted with each invoice. UTA shall have the right to disapprove (and withhold from payment) specific line items of each invoice to address non-conforming Work or invoicing deficiencies. Approval by UTA shall not be unreasonably withheld. UTA shall have the right to offset from payment amounts reasonably reflecting the value of any claim which UTA has against Consultant under this Contract. Payment for all invoice amounts not specifically disapproved by UTA shall be provided to Consultant within thirty (30) calendar days of invoice submittal.

## **ARTICLE 9.0**

### **Ownership of Materials**

- 9.1 All data including, but not limited to, maps, drawings, sketches, renderings, software, hardware, and specifications, including the original thereof, developed by Consultant as a part of its Work under this Contract (collectively and generically referred to in this Article as "Work Product" with the exception of any intellectual or proprietary property contained therein that is owned or created by Consultant (i.e TrainOps or Assural prior to the effective date of this Contract) are the property of UTA. All Work Product must be delivered to UTA no later than the completion of the Work and prior to final payment by UTA. In the event this Contract is terminated prior to completion of the Work, then Consultant shall transmit all Work Product completed or in process as of the date of termination.
- 9.2 UTA shall not be construed to be the owner of any intellectual property contained in the Work Product that was owned or created by Consultant outside of the scope of this Contract. However, with respect to such intellectual property of Consultant, Consultant hereby grants UTA a non-exclusive perpetual license to use such intellectual property to the full extent reasonably necessary for UTA's use and enjoyment of the Work Product furnished under this Contract.

## **ARTICLE 10.0**

### **Subcontracts**

- 10.1 Consultant shall give advance written notification to UTA of any proposed subcontract (not indicated in Consultant's Statement of Qualification) negotiated with respect to the Work. UTA shall have the right to approve all subcontractors, such approval not to be withheld unreasonably.
- 10.2 No subsequent change, removal or substitution shall be made with respect to any such subcontractor without the prior written approval of UTA.
- 10.3 Consultant shall be solely responsible for making payments to subcontractors, and such payments shall be made within thirty (30) days after Consultant receives corresponding payments from UTA.

- 104 Consultant shall be responsible for and direct all Work performed by subcontractors.
- 105 Consultant agrees that no subcontracts shall provide for payment on a cost-plus-percentage-of-cost basis. Consultant further agrees that all subcontracts shall comply with all applicable laws.

#### **ARTICLE 11.0**

##### **Key Personnel**

- 11.1 Consultant shall provide the key personnel as indicated in Consultant's Statement of Qualification (or other applicable provisions of this Contract), and shall not change any of said key personnel without the express written consent of UTA.

#### **ARTICLE 12.0**

##### **Suspension of Work**

- 121 UTA may, at any time, by written order to Consultant, require Consultant to suspend, delay, or interrupt all or any part of the Work called for by this Contract. Any such order shall be specifically identified as a "Suspension of Work Order" issued pursuant to this Article. Upon receipt of such an order, Consultant shall immediately comply with its terms and take all reasonable steps to minimize the incurrence of further costs allocable to the Work covered by the order during the period of Work stoppage.
- 122 If a Suspension of Work Order issued under this Article is canceled, Consultant shall resume Work as mutually agreed to in writing by the parties hereto.
- 123 If a Suspension of Work Order is not canceled and the Work covered by such order is terminated for the convenience of UTA, reasonable costs incurred as a result of the Suspension of Work Order shall be considered in negotiating the termination settlement.
- 124 If the Suspension of Work causes an increase in Consultant's cost or time to perform the Work, UTA's Project Manager or designee shall make an equitable adjustment to compensate Consultant for the additional costs or time, and modify this Contract by Change Order.

#### **ARTICLE 13.0**

##### **Termination for Convenience; Termination for Cause and Default Remedies**

- 13.1 UTA shall have the right to terminate this Contract at any time by providing written notice to Consultant. If this Contract is terminated for convenience, UTA shall pay Consultant its costs and a reasonable profit on work performed up to the effective date of the termination notice, plus costs reasonably and necessarily incurred by Consultant to effect such termination. UTA shall not be responsible for anticipated profits based on Work not performed as of the effective date of termination. Consultant shall promptly submit a termination claim to UTA. If Consultant has any property in its possession belonging to UTA, Consultant will account for the same, and dispose of it in the manner UTA directs.
- 13.2 If Consultant materially fails to perform any of its obligations under this Contract, and such failure is not cured or a cure initiated to the satisfaction of UTA within ten (10) days after receipt of written notice from UTA, UTA may, at its discretion:
- A. Terminate this Contract (in whole or in part) for default and complete the Work using other contractors or UTA's own forces, in which event Consultant shall be liable for all incremental costs so incurred by UTA;
  - B. Pursue other remedies available under this Contract (regardless of whether the termination remedy is invoked); and/or
  - C. Except to the extent limited by this Contract, pursue other remedies available at law.

Upon receipt of a termination notice as provided above, Consultant shall (i) immediately discontinue all Work affected (unless the notice directs otherwise); (ii) deliver to UTA all data,

drawings and other deliverables, whether completed or in process; and (iii) if Consultant has any property in its possession belonging to UTA, account for the same, and dispose of it in the manner UTA directs. Consultant shall remit a final invoice for all services performed and expenses incurred in full accordance with the terms and conditions of this Contract up to the effective date of termination. UTA shall calculate termination damages payable under this Contract, shall offset such damages against Consultant's final invoice, and shall invoice Consultant for any additional amounts payable by Consultant (to the extent termination damages exceed the invoice). All rights and remedies provided in this Article are cumulative and not exclusive.

- 13.3 If UTA terminates this Contract for any reason, Consultant shall remain available, for a period not exceeding 90 days, to UTA to respond to any questions or concerns that UTA may have regarding the Work completed by Consultant prior to termination.

#### **ARTICLE 14.0**

##### **Information, Records, and Reports; Audit Rights**

- 14.1 Consultant shall retain all books, papers, documents, accounting records and other evidence to support any cost-based billings allowable under Exhibit B (or any other provision of this Contract). Such records shall include, without limitation, time sheets and other cost documentation related to the performance of labor services, as well as subcontracts, purchase orders, other contract documents, invoices, receipts or other documentation supporting non-labor costs. Consultant shall also retain other books and records related to the performance, quality or management of this Contract and/or Consultant's compliance with this Contract. Records shall be retained by Consultant for a period of at least six (6) years after completion of the Work. During this six-year period, such records shall be made available at all reasonable times for inspection by UTA and other authorized parties including, but not limited to, the Federal Transit Administration. Copies of requested records shall be furnished to UTA or designated parties upon request. Consultant agrees that it shall flow-down (as a matter of written contract) these records requirements to all subcontractors utilized in the performance of the Work at any tier.

#### **ARTICLE 15.0**

##### **Findings Confidential**

- 15.1 Any documents, reports, information, or other data and materials available to or prepared or assembled by Consultant or subcontractors under this Contract are considered confidential and shall not be made available to any person, organization, or entity by Consultant without consent in writing from UTA.
- 15.2 It is hereby agreed that the following information is not considered to be confidential:
- A. Information already in the public domain;
  - B. Information disclosed to Consultant by a third party who is not under a confidentiality obligation;
  - C. Information developed by or in the custody of Consultant before entering into this Contract;
  - D. Information developed by Consultant through its work with other clients; and
  - E. Information required to be disclosed by law or regulation including, but not limited to,

subpoena, court order or administrative order.

- F. Information, the disclosure of which is reasonably necessary for the Consultant to defend itself from any suit or claim provided that Consultant shall seek protective orders as reasonably necessary to protect any trade secrets or safety sensitive information.

## ARTICLE 16.0

### General Indemnification, Insurance and Limitation of Liabilities

- 16.1 Except to the extent caused by the negligent acts or omissions of UTA, T the Consultant shall protect, release, defend, indemnify, and hold harmless UTA and its trustees, officers, employees and agents (hereinafter collectively "Indemnitees") against and from any and all claims, demands, suits, losses, costs and damages of every kind and description, including attorneys' fees and/or litigation expenses (hereinafter collectively "Claims"), brought or made against or incurred by any of the Indemnitees resulting from or arising out of the negligent acts or omissions (actual or alleged) of Consultant, its subcontractors or anyone employed directly or indirectly by any of them or anyone for whose acts any of them may be liable in conjunction with this Contract or any Work performed hereunder. If an employee of Consultant, a subcontractor, anyone employed directly or indirectly by any of them or anyone for whose acts any of them may be liable has a claim against UTA or another Indemnitee, Consultant's indemnity obligation set forth above will not be limited by any limitation on the amount of damages, compensation or benefits payable under any employee benefit acts, including workers' compensation or disability acts.
- 16.2 For the duration of this Contract, Consultant shall maintain at its own expense, and provide proof of said insurance to UTA, the following types of insurance:
- A. Occurrence type Commercial General Liability Insurance ISO CG001, with an edition date of 11-88 or later, covering the indemnity and other liability provisions of this Contract, with no exclusions of explosion, collapse or underground hazards. The limits shall be \$2,000,000 per occurrence with an annual aggregate of \$4,000,000. The policy shall be endorsed to include the following additional insured language: "The Utah Transit Authority shall be named as an additional insured with respect to liability arising out of the activities performed by, or on behalf of the Contractor, including completed operations."
- B. Professional Liability insurance with the following limits and coverages:
- Minimum Limits:  
\$1,000,000 each claim  
\$2,000,000 annual aggregate
- Coverages:
1. Insured's interest in joint ventures
  2. Punitive damages coverage (where not prohibited bylaw)
  3. Limited contractual liability
  4. Retroactive date prior to date
  5. Extended reporting period of 36 months

Coverage which meets or exceeds the minimum requirements will be maintained, purchased annually in full force and effect until 3 years past completion of the Work unless such coverage becomes unavailable to the market on a commercially reasonable basis, in which case Consultant will notify

UTA. If UTA agrees that such coverage is not reasonably available in the commercial market, Consultant may elect not to provide such coverage.

- C. Automobile insurance covering owned, if any, non-owned, and hired automobile with limits not less than \$2,000,000 combined single limit of coverage. The policy shall be endorsed to include the following additional insured language: "The Utah Transit Authority shall be named as an additional insured with respect to liability arising out of the activities performed by, or on behalf of the Contractor, including automobiles owned, leased, hired or borrowed by the Contractor."
- D. Workers' Compensation insurance conforming to the appropriate states' statutory requirements covering all employees of Consultant, and any employees of its subcontractors, representatives, or agents as long as they are engaged in the work covered by this Contract or such subcontractors, representatives, or agents shall provide evidence of their own Worker's Compensation insurance. The policy shall also cover Employers Liability with limits no less than \$500,000 each accident, and each employee for disease. The policy shall contain a waiver of subrogation against UTA.
- E. On insurance policies where UTA is named as an additional insured, UTA shall be an additional insured to the full limits of liability purchased by the Consultant. Insurance limits indicated in this agreement are minimum limits. Larger limits may be indicated after Consultant's assessment of the exposure for this contract; for its own protection and the protection of UTA. Consultant's insurance coverage shall be primary insurance and non-contributory with respect to all other available sources.  
The insurance requirements herein are minimum requirements for this Contract and in no way limit the indemnity covenants contained in this Contract. UTA is no way warrants that the minimum limits contained herein are sufficient to protect the Contractor from liabilities that might arise out of the performance of the work under this contract by the Contractor, his agents, representatives, employees, or subcontractors and Contractor is free to purchase additional insurance as may be determined necessary.

Consultant warrants that this Contract has been thoroughly reviewed by its insurance agent, broker or consultant, and that said agent/broker/ consultant has been instructed to procure for Consultant the insurance coverage and endorsements required herein.

Consultant shall furnish UTA with certificates of insurance (ACORD form or equivalent approved by UTA) as required by this Contract. The certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. All certificates and any required endorsements are to be received and approved by UTA before work commences. Each insurance policy required by this Contract must be in effect at or prior to commencement of work under this Contract and remain in effect for the duration of the project. Failure to maintain the insurance policies as required by this Contract or to provide evidence of renewal is a material breach of contract.

UTA, as a self-insured governmental entity, shall not be required to provide insurance coverage for the risk of loss to UTA premises and improvements or equipment owned by UTA.

- 163 On insurance policies where UTA is named as an additional insured, UTA shall be an additional insured to the full limits of liability purchased by the Consultant. Insurance limits indicated in this agreement are minimum limits. Larger limits may be indicated after Consultant's assessment of the exposure for this contract; for its own protection and the protection of UTA. Consultant's insurance coverage shall be primary insurance and non-

contributory with respect to all other available sources.

- 164 Consultant warrants that this Contract has been thoroughly reviewed by its insurance agent, broker or consultant, and that said agent/broker/ consultant has been instructed to procure for Consultant the insurance coverage and endorsements required herein.
- 165 Consultant shall furnish UTA with certificates of insurance (ACORD form or equivalent approved by UTA) as required by this Contract. The certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. All certificates and any required endorsements are to be received and approved by UTA before work commences. Each insurance policy required by this Contract must be in effect at or prior to commencement of work under this Contract and remain in effect for the duration of the project. Failure to maintain the insurance policies as required by this Contract or to provide evidence of renewal is a material breach of contract.
- 166 UTA, as a self-insured governmental entity, shall not be required to provide insurance coverage for the risk of loss to UTA premises and improvements or equipment owned by UTA.

#### **ARTICLE 17.0**

##### **Other Indemnities**

- 17.1 Consultant shall protect, release, defend, indemnify and hold harmless UTA and the other Indemnitees against and from any claim on account of infringement relating to Consultant's performance under this Contract. If notified promptly in writing and given authority, information and assistance, Consultant shall defend, or may settle at its expense, any suit or proceeding against UTA so far as based on a claimed infringement and Consultant shall pay all damages and costs awarded therein against UTA due to such breach. In case any portion of the Work is in such suit held to constitute such an infringement or an injunction is filed that interferes with UTA's rights under this Contract, Consultant shall, at its expense and through mutual agreement between the UTA and Consultant, either procure for UTA any necessary intellectual property rights, or modify Consultant's services or deliverables such that the claimed infringement is eliminated.

#### **ARTICLE 18.0**

##### **Independent Contractor**

- 18.1 Consultant is an independent contractor and agrees that its personnel will not represent themselves as, nor claim to be, an officer or employee of UTA by reason of this Contract. Consultant is responsible to provide and pay the cost of all its employees' benefits.

#### **ARTICLE 19.0**

##### **Prohibited Interest**

- 19.1 No member, officer, agent, or employee of UTA during his or her tenure or for one year thereafter shall have any interest, direct or indirect, including prospective employment by Consultant in this Contract or the proceeds thereof without specific written authorization by UTA.

#### **ARTICLE 20.0**

##### **Dispute Resolution**

- 20.1 The parties shall attempt to informally resolve all claims, counterclaims and other disputes through the escalation process described below. No party may bring a legal action to enforce any term of this Contract without first having exhausted such process.

20.2 The time schedule for escalation of disputes, including disputed requests for Change Order, shall be as follows:

<b>Level of Authority</b>	<b>Time Limit</b>
UTA's Project Manager/Consultant's Project Manager	Five calendar days
UTA's Sr. Supply Chain Manager/ Consultant's Business Group Leader	Five calendar days
UTA's VP of Finance/Consultant's Area Manager	Five calendar days

Unless otherwise directed by UTA's Project Manager, Consultant shall diligently continue performance under this Contract while matters in dispute are being resolved.

20.3 If the dispute cannot be resolved informally in accordance with the escalation procedures set forth above, then either party may commence legal action in accordance with the venue and law provisions of this Contract. If mutually agreed, the parties may also submit the dispute to arbitration or mediation.

### **ARTICLE 21 Successors and Assignees**

21.1 Consultant shall not assign, sublet, sell, transfer, or otherwise dispose of any interest in this Contract without prior written approval of UTA, and any attempted transfer in violation of this restriction shall be void.

### **ARTICLE 22.0 Nonwaiver**

22.1 No failure or waiver or successive failures or waivers on the part of either party in the enforcement of any condition, covenant, or article of this Contract shall operate as a discharge of any such condition, covenant, or article nor render the same invalid, nor impair the right of either party to enforce the same in the event of any subsequent breaches by the other party.

### **ARTICLE 23.0 Notices or Demands**

23.1 Any formal notice or demand to be given by one party to the other shall be given in writing by one of the following methods: (i) hand delivered; (ii) deposited in the mail, properly stamped with the required postage; (iii) sent via registered or certified mail; or (iv) sent via recognized overnight courier service. All such notices shall be addressed as follows:

If to UTA:

Utah Transit Authority  
ATTN: Brian Motes  
669 West 200 South, SLC , UT 84101

If to Consultant:

LTK Engineering Services  
Attn: Bill Lipfert  
35 Railroad Row, Suite 201,  
White River Junction, VT  
05001

with a required copy to:

Utah Transit Authority  
ATTN: General Counsel  
669 West 200 South  
Salt Lake City, Utah 84101

- 23.2 Any such notice shall be deemed to have been given, and shall be effective, on delivery to the notice address then applicable for the party to which the notice is directed; provided, however, that refusal to accept delivery of a notice or the inability to deliver a notice because of an address change which was not properly communicated shall not defeat or delay the giving of a notice. Either party may change the address at which such party desires to receive written notice by providing written notice of such change to any other party.
- 23.3 Notwithstanding Section 23.1, the parties may, through mutual agreement, develop alternative communication protocols to address change notices, requests for information and similar categories of communications. Communications provided pursuant to such agreed means shall be recognized as valid notices under this Contract

**ARTICLE 24.0**  
**Contract Administrator**

- 24.1 UTA's Contract Administrator for this Contract is Brian Motes or designee. All questions and correspondence relating to the contractual aspects of this Contract should be directed to said Contract Administrator, or designee.

**ARTICLE 25.0**  
**General Provisions**

- 25.1 Neither this Contract nor any interest herein may be assigned, in whole or in part, by either party hereto without the prior written consent of the other party, except that without securing such prior consent, either party shall have the right to assign this Contract to any successor or to such party by way of merger or consolidation or acquisition of substantially all of the entire business and assets of such party relating to the subject matter of this Contract, provided that such successor shall expressly assume all of the obligations and liabilities of such party under this Contract, and provided further, that such party shall remain liable and responsible to the other party hereto for the performance and observance of all such obligations.
- 25.2 This Contract shall be interpreted in accordance with the substantive and procedural laws of the State of Utah. Any litigation between the parties arising out of or relating to this Contract will be conducted exclusively in federal or state courts in the State of Utah and Consultant consents to the jurisdiction of such courts.
- 25.3 The headings of the articles, clauses, and sections of this Contract are inserted for reference purposes only and are not restrictive as to content.
- 25.4 The parties enter in to this Contract for the sole benefit of the parties, in exclusion of any third party, and no third party beneficiary is intended or created by the execution of this Contract.
- 25.5 Any provision of this Contract prohibited or rendered unenforceable by operation of law shall be ineffective only to the extent of such prohibition or unenforceability without invalidating the remaining provisions of this Contract.
- 25.6 This Contract shall constitute the entire agreement and understanding of the parties with respect to the subject matter hereof, and shall supersede all offers, negotiations and other agreements with respect thereto.
- 25.7 Any amendment to this Contract must be in writing and executed by the authorized representatives of each party.
- 25.8 This Contract may be executed in any number of counterparts and by each of the parties hereto on separate counterparts, each of which when so executed and delivered shall be an original, but all such counterparts shall together constitute but one and the same instrument. Any signature

page of this Contract may be detached from any counterpart and reattached to any other counterpart hereof. The electronic transmission of a signed original of this Contract or any counterpart hereof and the retransmission of any signed facsimile transmission hereof shall be the same as delivery of an original.

- 25.9 Provisions of this Contract intended by their nature and content to survive termination of this Contract shall so survive including, but not limited to, Articles 9, 13, 14, 15, 16, 17, 19, 20 and 25.

**ARTICLE 26.0**  
**Incorporated Documents**

- 26.1 UTA's RFP 19-03139TP including all federal clauses and other attachments, and Consultant's Statement of Qualification, including Exhibits A, B and C, and the Assumptions found in Exhibit A, are hereby incorporated into and made a part of this Contract, except to the extent that such documents were changed or altered by subsequent negotiations as indicated by the terms of this Contract. However, the terms and conditions of this Agreement shall take precedence over any language contained in an exhibit.

**ARTICLE 27.0**  
**Insurance Coverage Requirements for Consultant Employees**

- 27.1 The following requirements apply to the extent that: (i) the initial value of this Contract is equal to or in excess of \$2 million; (ii) this Contract, with subsequent modifications, is reasonably anticipated to equal or exceed \$2 million; (iii) Consultant has a subcontract at any tier that involves a sub-consultant that has an initial subcontract equal to or in excess of \$1 million; or (iv) any subcontract, with subsequent modifications, is reasonably anticipated to equal or exceed \$1 million:
- A. Consultant shall, prior to the effective date of this Contract, demonstrate to UTA that Consultant has and will maintain an offer of qualified health insurance coverage (as defined by Utah Code Ann. § 17B-2a-818.5) for the Consultant's employees and the employee's dependents during the duration of this Contract.
  - B. Consultant shall also demonstrate to UTA that subcontractors meeting the above-described subcontract value threshold have and will maintain an offer of qualified health insurance coverage (as defined by Utah Code Ann. § 17B-2a-818.5) for the subcontractor's employees and the employee's dependents during the duration of the Subcontract.

IN WITNESS WHEREOF, the parties have made and executed this Contract as of the day and year first above written.

**UTAH TRANSIT AUTHORITY:**

By \_\_\_\_\_

Name: Carolyn Gonot

Date: \_\_\_\_\_

Title: Executive Director

**LTK ENGINEERING SERVICES**

By  \_\_\_\_\_

Name: Dominic A. DiBrito, P.E.

Date: January 8, 2020

Title: President

By \_\_\_\_\_

Name: Mary DeLoretto

Date: \_\_\_\_\_

Title: Acting Chief  
Services Development

By \_\_\_\_\_

Name \_\_\_\_\_

Date: \_\_\_\_\_

Title \_\_\_\_\_

Approved as to Form and Content

Fed Id# 23-2309997

\_\_\_\_\_

Name: Michael Bell

Title: Assistant Attorney  
General and UTA Counsel

Reviewed & Recommended

\_\_\_\_\_

UTA Project Manager

UTA CONTRACT NO. 19-03139TP

Exhibit A  
Scope of Work and Cost Proposal

UTA Future of Light Rail Study  
(Revised January 2, 2020)

## Scope of Work

### Project Description

The Future of Light Rail Study will analyze and recommend service, operational, and capital improvements to the regional light rail network, including TRAX and Streetcar, to improve its existing function and accommodate future growth. The study area will include all existing TRAX and Streetcar lines and any planned TRAX and Streetcar lines in the WFRM and MAG 2019-2050 RTP documents.

The study will evaluate a range of short and long term improvements related to fleet modifications, headways and span of service, alignments of track extensions, potential station locations, considering projects identified in regional transportation plans and other potential enhancements. The impact of each alternative to the system at large, including associated costs, will be examined. The study will recommend both short and long-term enhancements and a strategy and timeline for implementation. The study will consider existing conditions, stakeholder input, projected changes in land use, and benefits and costs of various scenarios. The study will also consider connections and implications of other transit services, including FrontRunner and bus. Ridership modeling results, capital costs and other metrics will be provided to evaluate defined scenarios. Ultimately, the study will recommend: 1) a phased approach to implementing realistic incremental enhancements that will meet immediate needs and improve operational efficiencies and 2) capital improvements that increase capacity to accommodate future growth and 3) propose a draft light rail system plan to be considered for the 2023-2050 RTP.

It is understood that other, separate studies are being performed that consider transit improvements on certain corridors that may evaluate potential light rail alignments. It is anticipated that findings from these studies will be valuable in informing potential additional light rail corridors and/or impacts to existing light rail corridors and will have implications that impact this study. In order to better coordinate findings of all studies, the Future of Light Rail study will be performed in two phases. The first phase will analyze existing conditions, summarize findings and develop preliminary recommendations. Upon the determination of a locally preferred alternative (LPA) for proposed future corridors, the second phase of this study will commence and include the development of alternatives, project screening and an implementation plan. UTA may re-evaluate the study findings after Phase 1 and determine whether or not to perform Phase 2.

### Study Goals & Objectives

Goal	Objectives
Develop plan to improve ridership outcomes	<ul style="list-style-type: none"><li>• Perform root cause analysis of ridership trends</li><li>• Identify focus areas that are under UTA management</li><li>• Use market data to identify potential new riders</li></ul>
Define appropriate span and frequency of service for current and projected demand	<ul style="list-style-type: none"><li>• Analyze benefits of improved span and frequency</li><li>• Determine capital, operations and maintenance cost increases associated with various improvements</li><li>• Consider benefit and cost of eliminating freight traffic from the main line</li></ul>
Recommend necessary fleet modifications and facility needs	<ul style="list-style-type: none"><li>• Consider necessary modifications to existing fleet, to include ADA accessible low-floor vehicles with each consist</li><li>• Evaluate necessary fleet expansion and facility needs in concert with recommended improvements of service or expansions</li><li>• Evaluate the facility and resource needs for extended overhaul program of existing and future light rail fleet</li><li>• Evaluate the realistic life of the existing light rail fleet and create an estimated cost and strategy for replacement</li></ul>

Recommend projects that improve speed, reliability and safety of existing system	<ul style="list-style-type: none"> <li>• Consider grade-separated crossings at priority locations</li> <li>• Evaluate benefits of removing shared left turns</li> <li>• Consider signaling improvements</li> <li>• Consider implications of impending positive train control</li> </ul>
Refine and define LRT expansion proposals or concepts	<ul style="list-style-type: none"> <li>• Perform a scenario analysis on the choices of proposed concepts with various alignments including baseline delivery timelines</li> <li>• Consider all costs and needs associated with expanded system, including recommendations developed through the Point of the Mountain Alternatives Analysis if applicable</li> <li>• Attach planning level ridership to system scenarios</li> <li>• Identify whether a revised light rail system should be proposed for the initial outreach during the next RTP cycle</li> </ul>

## Phase 1: Existing Conditions and Performance Analysis and Preliminary Considerations

### Task 1.1: Project Management

Throughout both Phase 1 and 2, the consultant will provide overall direction and control for the tasks. The consultant project manager will be responsible for team coordination, implementation of quality-control measures, project reporting to UTA, project documentation, contract management and overall performance of the project.

The study will require extensive communication with UTA light rail services, planning, capital development, communications and administration.

Underpinning this effort will be adherence to LTK's Quality Procedures or "approved equals" utilized by LTK sub consultants.

Within 2 weeks of receiving Notice to Proceed, the consultant team will submit a draft Project Management Plan (PMP) for review and approval by UTA. The PMP will include the work scope as annotated by the consultant team and approved by the UTA, schedule, budget, quality control, and invoicing protocol. The consultant team will deliver timely and thorough monthly progress reports that detail task-by-task work accomplished within the current reporting period, costs (and balance remaining) and work activities anticipated in the next reporting period. Any areas of concern – especially those related to schedule adherence – will be detailed.

Subject to concurrence by the UTA Project Manager, the consultant team will work to engage UTA Light Rail Business Unit, Planning, Capital Development/Engineering, Communications and Administration as part of the study. Early in the study, the consultant team will develop a comprehensive Information Request List that will include requested data and areas of discussion/inquiry with each department.

#### Tasks

- Develop a Project Management Plan (PMP) that includes the advertised work scope, schedule, budget, quality control, and invoicing protocol
- Project data request list development with periodic updates to UTA as documents/databases are received and new reference data types are identified during the course of the study.
- Create and maintain project record files, including meeting agendas and minutes, to be transmitted in digital format to UTA upon milestone and study completion

#### Deliverables

- Project Management Plan
- Monthly progress reports with invoicing, to include a text narrative of services rendered during that billing period
- Meeting minutes

### Task 1.2: Public and Stakeholder Engagement

Key stakeholders, UTA riders and the general public have valuable insight and will be given opportunities to inform the results of this study. To better understand current and future system needs, the consultant will involve stakeholders and the public through online and in-person engagement. Engagement should be targeted in areas with existing or proposed light rail service, and should be closely tied to the overall work effort to inform the existing conditions analysis in Phase 1 and development of the various alternatives in Phase 2. Opportunities for review, input and updates to the group should occur at

key milestones and at the conclusion of the study to highlight next steps and a strategy for implementation. Task 1.2 describes outreach activities for both Phase 1 and Phase 2 of this scope of work.

At the commencement of the study process, the consultant will work with the UTA Project Manager and UTA's Communications Department to propose a public engagement plan (PEP) that appropriately involves riders, the general public and other key stakeholders. The PEP will describe the audience, purpose, methods, key messages, and timing of engagement. The Technical Advisory Committee (TAC) will be comprised of representatives from UTA, Utah Department of Transportation (UDOT), Wasatch Front Regional Council (WFRC), Mountainland Association of Governments (MAG) and other regional partners as appropriate. Additional stakeholders may be invited as needed to the in-person meetings. For the purposes of this scope of work, the consultant team will assume responsibility for organizing, preparing materials, facilitating, and preparing documentation for up to five in-person TAC/stakeholder meetings (up to two in Phase 1, up to three in Phase 2), and three additional TAC-only web-based meetings in each phase. The project team may conduct additional outreach to the TAC outside of meetings, as needed, to gather feedback and direction on the technical analysis.

It is assumed that the consultant team will not be involved in Executive Committee meetings with agency leadership, but that the consultant team will support UTA in preparing for Executive Committee meetings by revising TAC meeting materials (handouts and presentations) to meet the needs of an executive audience.

The public will be engaged through online strategies. The consultant team will help UTA develop content for two online outreach periods, in order to support the technical aspects of the work, and that UTA will lead the development of online engagement materials. The consultant team will integrate the results of online engagement activities into the technical analysis as deemed appropriate by the project team. The specific tactics to be employed in online engagement will be solidified in the development of the PEP. The consultant team will support the UTA in one public meeting, to be held during Phase 2 in conjunction with one of the in-person TAC/stakeholder meetings referenced above.

#### *Tasks*

- Develop Public Engagement Plan (PEP)
- Facilitate four in-person meetings of TAC/stakeholders and three TAC web-based meetings, with UTA formally administering the committee formation and management
- Assist UTA in developing online engagement materials

#### *Deliverables*

- Public Engagement Plan
- Agendas, minutes, and records of decisions, and milestone presentation materials for TAC
- Public engagement results (to be provided by UTA)

### **Task 1.3: Existing Conditions Analysis**

This task includes gathering data and information, including pertinent existing studies and plans, necessary to thoroughly assess the current physical condition, service characteristics, and utilization of UTA's light rail system relative to the study goals. The consultant will primarily take advantage of data that has already been collected by UTA. Data that UTA collects regularly will be readily available. The consultant will determine its efficacy relative to its use in the study. The consultant will be responsible for the collection of any other data.

This task also benchmarks TRAX in terms of transportation system performance, ridership, infrastructure, and light rail fleet. While all four areas are interrelated, their complexity warrants additional detail in terms of subtasks which are detailed below.

#### **Task 1.3.1 Existing TRAX System Performance**

Using "light simulation", the consultant team will benchmark existing system performance in terms of travel times, average speeds, reliability, peak fleet required to deliver service, and delay per distance traveled (including traffic signal delays versus light rail junction delays). This will serve as the basis for comparing service delivery benefits of specific infrastructure and operational initiatives in Phase 2.

Light simulation is a technique appropriate to light rail and streetcar operation where most of the capacity constraints and reliability challenges related to non-interlocking junctions and traffic signal intersections. This is the case for UTA's light rail and streetcar network.

The consultant team will use LTK TrainOps software but limited to:

- Station-to-station distances,
- Junction track layouts,
- Traffic signal intersections and delay probabilities due to lack of full priority,
- Operations including current schedule, three fleet types and dwell time variability (including use of high blocks and bridge plates for boarding)
- Maximum operating speeds
- Significant grades (2 percent or greater).

The consultant team will not code time-consuming signal systems and its routes/aspects in the light simulation model. Similarly, there will be no time-consuming coding of the detailed vertical profile and horizontal alignment of the tracks.

Outside of simulation, the consultant team will identify system efficiency (ridership density by line and by segment), span of service and the temporally-separated freight operations that constrain late-night operation on some nights.

### **Task 1.3.2 Existing TRAX System Ridership and Recent Trends**

Recent FTA reporting indicates a TRAX ridership decline more significant than national light rail declines over the last year. While all transit modes have experienced downward pressure due to low gas prices, the rise of Uber and Lyft, and other external factors, it's important to understand UTA-specific ridership trends and their underlying causes. The consultant team will conduct a ridership gap analysis to get an understanding of why ridership is declining, building on trends observed in metropolitan areas around the country. This will include a statistical analysis of the patterns that are known to affect transit ridership nationally (changes in gas prices, vehicle operating costs, and asocial human behavior, among others) and the degree to which these patterns are happening here. The ridership gap analysis will also evaluate land use development patterns around light rail stations throughout the TRAX network: is TOD being implemented at the levels of geographic coverage and intensity previously identified (based on regional planning documents such as the Wasatch Choice for 2040 Vision), and is it resulting in the kinds of transit ridership that we would expect? If TOD patterns and/or the resultant ridership is not to the level previously anticipated, we will explore the reasons for the disconnect between the expectations and the outcomes, to help inform development of future scenarios. The consultant team will use the most recent UTA on-board survey results and other available data, including Automatic Passenger Counter (APC) based data, as part of our analysis. Recently-added highway capacity in the region, parking pricing, and other competitive factors that may reduce the relative attractiveness of light rail and other transit modes will be considered. In addition, extenuating factors, such as those related to Operation Rio Grande, will be considered. As part of this task, the consultant team will facilitate an additional workshop (beyond the two Phase 1 meetings identified in Task 1.2) with UTA and the TAC to explore the reasons behind declining ridership and how the factors should be considered in the development of scenarios in Phase 2 of this scope of work.

The Green, Red and Blue terminal pairings are the subject of much discussion among TRAX riders. Using on-board survey data, the consultant team will look at the distribution of trips that reflect a "one seat ride" versus transfers from other UTA modes (bus, FrontRunner) versus transfers from one light rail line to another. This may suggest several operational changes that will then be analyzed as part of broader scenarios in Phase 2.

Additional detailed ridership analysis will be performed in Task 2.2, described below.

### **Task 1.3.3 Existing TRAX Infrastructure**

The consultant team will perform a systems analysis to understand the opportunities (in Phase 2) of faster travel times, improved reliability and new/overlaid services. Through interviews with UTA Light Rail Business Unit and Capital

Development/Engineering, the team will seek to understand capacity constraints related to power (substation capacity, substation spacing, OCS configuration, sectionalizing) and constraints related to the signal system (block spacing, extent of bidirectional signaling, emergency crossover locations, supervisory control capability). This includes the current push-button route select system and its inherent limitations.

Unlike commuter rail, light rail has no regulatory requirement to implement PTC in the US. However, some US light rail properties (Newark, Los Angeles, Dallas, Seattle) have forms of Automatic Train Control that protect civil speeds and enforce signals at stop. Other systems (Denver, Portland, Pittsburgh) have Automatic Train Stop that enforce only signals at stop. LTK is pioneering a PTC-like system on the Boston Green Line LRT known as the Collision Warning System that will enforce civil speed limits and signals at stop using lower cost technology than transit ATC or railroad-style PTC. PTC for light rail will be addressed qualitatively during the study by the consultant team. While PTC will be studied, it's important to note that implementing PTC on light rail would increase trip times and likely cause additional ridership losses.

Given that all three existing lines include significant traffic signal interface, the team will work to understand the extent to which light rail traffic signal priority is in effect and opportunities for improvement. This will require interviews with both UTA personnel and non-UTA traffic engineers responsible for implementing priority logic at specific intersections. This will inform the study in preparation for the Phase 2 analysis of potential improved priority schemes.

#### **Task 1.3.4 Existing TRAX Fleet**

TRAX currently operates three models of Siemens LRTs – high floor SD100s, high floor SD160s and low floor S70s. The 23 SD100s date to TRAX system opening in 1999 while the 17 Siemens SD160s were added in 2001 and 2003 as the system first expanded. UTA is currently performing a mid-life overhaul of these two fleets in order to ensure that they live up to their projected 30-year lifespans. The consultant team will work to understand the effort being performed and the likely new end-of-useful life dates for these fleets. The team will also evaluate the possibility of a sale of the high floor vehicles to a system with all high floor operation (such as Denver RTD), clearing the way for all low floor TRAX operation.

Unlike the S70s (which dominate the TRAX fleet with 77 LRVs, including 3 S70s used in streetcar service), the SD100s and SD160s require use of the “high block” at each platform for accessible boarding and alighting. The team will analyze the operational implications of SD100/SD160 operation versus S70 operation in terms of dwell time and the need for precision berthing.

The consultant team will also review, at a planning level, the adequacy of UTA's Vehicle Maintenance facilities with respect to the current fleet, along with estimates of future fleet expansion that would trigger the need for expansion or new facilities. This is an important input to Phase 2, detailed below.

#### *Tasks*

- Identify and compile all necessary data to inform analysis, including but not limited to:
  - System performance, including ridership, investment per rider, reliability, travel times and other performance metrics in relation to the characteristics of the system (track and route alignments, span and frequency of service)
  - Fleet, platform and other facility characteristics
  - Systems including signal blocking and substation power capacity
- Analyze data in light of identified study goals
- Perform root cause analysis of ridership decline
  - Consider regional productions and attractions of existing travel demand using the most recent onboard survey and other valid data points
  - Consider socio-economic factors, including impacts of free fare zone
  - Analyze recent and impending changes in land-use, including transit-oriented development (TOD)
  - Identify focus areas over which UTA has management
  - Consider the results of recent onboard surveys

- Consider the results of a potential on-line survey to be developed by UTA and the LTK Team, to be administered and publicized by the UTA

#### *Deliverables*

- Existing conditions report including:
  - “light simulation” report detailing calibration to existing conditions and key baseline metrics (average speeds, minutes of congestion, peak fleet requirement)
  - Existing TRAX system ridership, recent trends and underlying causes (stand-alone chapter or chapters to facilitate separate distribution as required),
  - Existing TRAX fleet and maintenance facility high-level assessment (stand-alone chapter or chapters to facilitate separate distribution as required).

#### **Task 1.4: Summary of Findings and Preliminary Considerations**

Based upon the analysis performed in Task 1.3, the consultant will produce findings which summarize identified actions to be further evaluated and, where appropriate, produce preliminary considerations to be further vetted in Phase 2. Findings are anticipated to include specific issues that should be addressed to improve service and meet existing and future demand for light rail service. Provide preliminary considerations that focus on actions that can be taken regardless of the outcomes of other analyses.

The consultant team will distill the findings of Task 1.3’s four elements to develop a summary of key findings. This will include a “long list” of potential improvements to light rail that will boost ridership. Each of the improvements will be tagged qualitatively in terms of travel time, reliability, connectivity, frequency and/or span of service benefits. The consultant team will assume a consistent fare structure in all of the work.

#### *Tasks*

- Develop a summary of findings and preliminary considerations to improve light rail service or operations based upon analysis performed in Task 1.3
- Organize and lead TAC workshop to review individual potential TRAX improvements and shortlist/organize them.
- Combine improvements into proposed system scenarios, summarizing their selection in a technical memo

#### *Deliverables*

- Materials for TAC and Stakeholders meeting, minutes of meeting
- Tech memo summarizing findings and preliminary considerations

## Phase 2: Project screening, Selection and Implementation Plan

Project Management and Public and Stakeholder Engagement Described in Task 1.1 and 1.2 will occur throughout both phases of the project.

#### **Task 2.1: Scenario development**

The consultant will develop a range of scenarios to accomplish project goals and objectives. Scenarios will be identified and evaluated that include logical compilations of projects. Scenarios will include both short and long term improvements including enhancements to the existing system, including span and frequency improvements, route re-alignments, fleet modifications, safety improvements, as well as potential expansion concepts including extensions and infill stations and their associated fleet and facility needs and include their associated planning level costs. Existing and planned FrontRunner and feeder/connecting bus services will also be incorporated to evaluate the alternatives from the perspective of the entire transit system.

Working with the study TAC and other stakeholders and using the attached “UTA Light Rail Opportunities” diagram (which includes the WFRC and MAG 2019-2050 Regional Transportation Plan light rail improvements as well as other more focused improvements identified by the consultant team) as a starting point for discussion, the consultant team will develop a range of scenarios to accomplish project goals and objectives. The five scenarios will be designed to:

- Represent a range of investment levels,
- Include complementary – not competing – improvements,
- To the greatest extent possible, allow the benefits of individual improvements to be estimated.

Recommendations from the Point of the Mountain Alternatives Analysis and other applicable studies will be included as directed by the UTA and as agreed to by the TAC and other stakeholders.

As shown in the “UTA Light Rail Opportunities” diagram, there are two TRAX segments with temporally-separated freight service. The consultant team will consider the benefit and cost of eliminating freight traffic from the main line by creating

alternative freight-only access. The consultant team will also recommend projects that improve frequency, speed and/or reliability of the existing system, including possible grade-separated crossings at locations found to be most delay-prone (see task 1.3.1).

The consultant team will prepare a Scenarios (Alternatives) Report which details the improvements package of each of the five scenarios, the focus of the scenario in terms of growing light rail ridership, and associated planning-level capital and O&M costs.

#### *Task*

- Research, compile and develop a comprehensive, categorized list of potential current and future service and capital improvements
- Develop scenarios that include appropriate associated projects

#### *Deliverable*

- Scenarios Report which explains each scenario, its purpose, and associated planning-level capital and operating costs

### **Task 2.2: Alternative Screening**

This task includes development of a screening methodology for the five future TRAX scenarios identified in Task 2.1 as well as the actual screening process. The process will start with a “fatal flaw” screening that removes improvements deemed infeasible due to environmental justice, economic, environmental, and historic and cultural resource issues.

The LTK Team will develop screening criteria based on input from the TAC and the UTA. As part of one of the Phase 2 TAC meetings, the LTK Team will lead a focused workshop to vet and agree on screening criteria. It is understood that there is one level of screening, consistent with the fatal flaw screening approach.

UTA will arrange for WFRC and/or in-house ridership model runs for the five scenarios based on consultant input specification for transit service and land use. Input specification will include recommendations of land use density and intensity around station areas to achieve the desired ridership results, based on insights gleaned during Phase 1. The LTK Team will look at a drastically more transit-supportive land use scenario to determine the effect that a drastic change in land use policy may have on overall system ridership.

Building on the work in Task 1.3.2, the consultant team will analyze recent and impending changes in land-use, including TOD in place and planned. The team will work to identify existing disincentives to riding TRAX including multimodal connection challenges, parking, transfers, travel time, reliability, frequency and span of service. This will include an isochronal assessment of the region’s largest employment markets and their level of accessibility to potential employees, specifically evaluating the number of people that could reach these markets on a one-seat transit ride; we will also evaluate whether that level of accessibility is expected to expand in the future given network and land use changes.

The consultant team will parse the results to identify benefits associated with specific improvements or groups of improvements embodied in specific scenarios.

On the benefits side, the consultant team will use the ridership model runs and professional judgment to develop methods for assigning new UTA riders and riders diverted from other modes (bus, FrontRunner). The consultant team will work to develop methods for annual passenger-minutes of travel time saved for specific improvements. On the cost side, the consultant team will incorporate O&M and capital cost differences (see task 2.3) into screening criteria for benefit-cost.

The consultant team will develop a technical memo that reports on both the evaluation methodology and the evaluation results of the scenarios. This will explain the costs and benefits of each identified scenario, including narrative that explains how each component project/operating initiative contributes to the overall outcome of the scenario.

#### *Tasks*

- Develop evaluation criteria to screen alternatives
- Produce planning level costs of criteria

#### *Deliverable*

- Alternatives evaluation memo that explains the costs and benefits of each identified scenario, including an explanation about how each project contributes to the outcome.

### **Task 2.3: Project Identification and Implementation Plan**

Based upon the results of Task 2.2, recommend short and long-range service enhancements and capital projects to the UTA light rail system and a phased plan for implementation, including proposed funding and financing opportunities. Identified projects should include all costs and associated needs, including additional fleet, facilities, future state of good repair and labor. Timing of implementation will be estimated, based upon projected need and financial constraints.

Working with the TAC and other stakeholders, the consultant team will develop visions for both short-range and long-range versions of TRAX. These will define rail service plans, including terminal-to-terminal pairings (with extensions, as applicable), frequency, span of service and multimodal connectivity. Underpinning these visions will be required capital improvements, fleet expansion and O&M cost deltas from the present. Within the short-range and long-range visions, the consultant team will identify priorities based on perceived benefit-cost ratios, regional priorities and other inputs from the

TAC/stakeholders. The consultant team will identify whether a revised light rail system should be proposed for initial outreach during the next RTP cycle.

Infrastructure capital improvement costs will be estimated based on the team's cost estimating expertise and engagement with UTA Capital Development/Engineering. Fleet expansion costs will be estimated by LTK's Vehicle Estimating Group which maintains a comprehensive database of global LRT procurement costs. In addition, the consulting team will develop a high-level funding plan that identifies potential private sector funding (TOD, TIF) as well as local, State and federal funding, incorporating all of this into the UTA Light Rail Strategic Plan. The Plan's Executive Summary will be designed as a stand-alone document for dissemination without the extensive back-up included in Volume II of the plan.

*Tasks*

- Develop recommended list of short and long term improvements, phased projects and service enhancements to the UTA light rail system
- Develop a strategic plan which outlines next steps and action items for implementation

*Deliverables*

- A compiled list of proposed improvements to the existing system and future corridors with associated planning level costs
- A proposed implementation schedule based on the phased future light rail travel demand and a sketch level Benefit Cost Analysis
- Final Report, structured as the UTA Light Rail Strategic Plan, which summarizes analysis, findings, and recommendations including estimated budgeting costs using the phased project delivery timelines.

**Firm Fixed Not-to-Exceed Prices**

## LTK Engineering Services

UTA - Future of Light Rail Study

RFQ No.: 19-3139TP

P5525 - Cost Estimate

Phase 1					
Firm	Hours	Labor	Travel	Total	
LTK Engineering Services	696	\$ 110,068	\$ 3,600	\$	113,668
Avenue Consultants	62	\$ 12,604	\$ -	\$	12,604
Fehr & Peers	208	\$ 30,949	\$ -	\$	30,949
HDR Engineering	122	\$ 25,726	\$ -	\$	25,726
Subtotal - Phase 1	1,088	\$ 179,348	\$ 3,600	\$	182,948

Phase 2					
Firm	Hours	Labor	Travel	Total	
LTK Engineering Services	720	\$ 113,336	\$ 3,600	\$	116,936
Avenue Consultants	78	\$ 14,284	\$ -	\$	14,284
Fehr & Peers	240	\$ 36,939	\$ -	\$	36,939
HDR Engineering	188	\$ 48,566	\$ -	\$	48,566
Subtotal - Phase 2	1,226	\$ 213,125	\$ 3,600	\$	216,725

<b>TOTALS - PHASE 1 &amp; PHASE 2</b>	<b>2,314</b>	<b>\$ 392,473</b>	<b>\$ 7,200</b>	<b>\$</b>	<b>399,673</b>
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	LTK Engineering Services												Avenue Consultants	
	Bill Lipfert	Tom Matoff	Russell Primeau	Jonathan Powell	Chelsea Farnsworth	Ned Parker	Dan Lang	Brian Jitloff	Yed Rosenbaum	Kevin Miller	Melvin Clark	Beth Beraldi	Ivan Hooper	Shawn Larson
	\$ 325.19	\$ 283.81	\$ 113.13	\$ 100.72	\$ 111.29	\$ 241.55	\$ 163.59	\$ 157.62	\$ 136.37	\$ 196.15	\$ 238.89	\$ 82.54	\$ 217.85	\$ 127.57
<b>Phase 1 - Existing Conditions and Performance Analysis and Preliminary Considerations</b>														
Task 1.1 - Project Management	48	8										32		
Task 1.2 - Public and Stakeholder Engagement	24	4												
Task 1.3.1 - Existing TRAX System Performance	16		80	40	160							64		
Task 1.3.2 - Existing TRAX System Ridership and Recent Trends			32										40	
Task 1.3.3 - Existing TRAX Infrastructure	16							8	8	8	8	8		10
Task 1.3.4 - Existing TRAX Fleet	4	4	8					24						
Task 1.4 - Summary of Findings and Preliminary Considerations	32	4	16									40	12	
<b>Subtotal Task 1 Hours</b>	<b>140</b>	<b>20</b>	<b>136</b>	<b>40</b>	<b>160</b>	<b>0</b>	<b>24</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>144</b>	<b>52</b>	<b>10</b>
<b>Subtotal Task 1 Labor</b>	<b>\$ 45,527</b>	<b>\$ 5,676</b>	<b>\$ 15,386</b>	<b>\$ 4,029</b>	<b>\$ 17,806</b>	<b>\$ -</b>	<b>\$ 3,926</b>	<b>\$ 1,261</b>	<b>\$ 1,091</b>	<b>\$ 1,569</b>	<b>\$ 1,911</b>	<b>\$ 11,886</b>	<b>\$ 11,328</b>	<b>\$ 1,276</b>
<b>Phase 2 -</b>														
Task 2.1 - Project Management	40	8										48		
Task 2.2 - Scenario Development	16	4										40		12
Task 2.3 - Scenario Screening	16		40	40	240	40	24		16			40	40	12
Task 2.4 - Project Identification and Implementation Plan	32	8										40	8	6
Task 2.5 - Public and Stakeholder Engagement	24	4												
<b>Subtotal Task 2 Hours</b>	<b>128</b>	<b>24</b>	<b>40</b>	<b>40</b>	<b>240</b>	<b>40</b>	<b>24</b>	<b>0</b>	<b>16</b>	<b>0</b>	<b>0</b>	<b>168</b>	<b>48</b>	<b>30</b>
<b>Subtotal Task 2 Labor</b>	<b>\$ 41,624</b>	<b>\$ 6,811</b>	<b>\$ 4,525</b>	<b>\$ 4,029</b>	<b>\$ 26,710</b>	<b>\$ 9,662</b>	<b>\$ 3,926</b>	<b>\$ -</b>	<b>\$ 2,182</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 13,867</b>	<b>\$ 10,457</b>	<b>\$ 3,827</b>
<b>Total Hours</b>	<b>268</b>	<b>44</b>	<b>176</b>	<b>80</b>	<b>400</b>	<b>40</b>	<b>48</b>	<b>8</b>	<b>24</b>	<b>8</b>	<b>8</b>	<b>312</b>	<b>100</b>	<b>40</b>
<b>Total Labor</b>	<b>\$ 87,151</b>	<b>\$ 12,488</b>	<b>\$ 19,911</b>	<b>\$ 8,058</b>	<b>\$ 44,516</b>	<b>\$ 9,662</b>	<b>\$ 7,852</b>	<b>\$ 1,261</b>	<b>\$ 3,273</b>	<b>\$ 1,569</b>	<b>\$ 1,911</b>	<b>\$ 25,752</b>	<b>\$ 21,785</b>	<b>\$ 5,103</b>

	152.39% OH												118.59		150.33%	
Multiplier	2.8268												2.4482		2.8037	
2019 DL Rate	\$ 110.62	\$ 96.54	\$ 38.48	\$ 34.26	\$ 37.86	\$ 82.16	\$ 55.64	\$ 53.62	\$ 53.56	\$ 66.72	\$ 81.26	\$ 28.08	\$ 74.71	\$ 43.75		
2020 Escalation @ 4%	\$ 115.04	\$ 100.40	\$ 40.02	\$ 35.63	\$ 39.37	\$ 85.45	\$ 57.87	\$ 55.76	\$ 55.70	\$ 69.39	\$ 84.51	\$ 29.20	\$ 77.70	\$ 45.50		
2020 Loaded Rate	\$ 325.19	\$ 283.81	\$ 113.13	\$ 100.72	\$ 111.29	\$ 241.55	\$ 163.59	\$ 157.62	\$ 136.37	\$ 196.15	\$ 238.89	\$ 82.54	\$ 217.85	\$ 127.57		
<b>Total</b>	<b>\$ 45,526.60</b>	<b>\$ 5,676.20</b>	<b>\$ 15,385.68</b>	<b>\$ 4,028.80</b>	<b>\$ 17,806.40</b>	<b>\$ -</b>	<b>\$ 3,926.16</b>	<b>\$ 1,260.96</b>	<b>\$ 1,090.96</b>	<b>\$ 1,569.20</b>	<b>\$ 1,911.12</b>	<b>\$ 11,885.76</b>	<b>\$ 11,328.20</b>	<b>\$ 1,275.70</b>		
												<b>\$ 110,067.84</b>		<b>\$ 12,603.90</b>		
2019 DL Rate	\$ 110.62	\$ 96.54	\$ 38.48	\$ 34.26	\$ 37.86	\$ 82.16	\$ 55.64	\$ 53.62	\$ 53.56	\$ 66.72	\$ 81.26	\$ 28.08	\$ 74.71	\$ 43.75		
2020 Escalation @ 4%	\$ 115.04	\$ 100.40	\$ 40.02	\$ 35.63	\$ 39.37	\$ 85.45	\$ 57.87	\$ 55.76	\$ 55.70	\$ 69.39	\$ 84.51	\$ 29.20	\$ 77.70	\$ 45.50		
2020 Loaded Rate	\$ 325.19	\$ 283.81	\$ 113.13	\$ 100.72	\$ 111.29	\$ 241.55	\$ 163.59	\$ 157.62	\$ 136.37	\$ 196.15	\$ 238.89	\$ 82.54	\$ 217.85	\$ 127.57		
<b>Total</b>	<b>\$ 41,624.32</b>	<b>\$ 6,811.44</b>	<b>\$ 4,525.20</b>	<b>\$ 4,028.80</b>	<b>\$ 26,709.60</b>	<b>\$ 9,662.00</b>	<b>\$ 3,926.16</b>	<b>\$ -</b>	<b>\$ 2,181.92</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 13,866.72</b>	<b>\$ 10,456.80</b>	<b>\$ 3,827.10</b>		
												<b>\$ 113,336.16</b>		<b>\$ 14,283.90</b>		

	Fehr & Peers						HDR Engineering						Total Hours
	Maria Vyas	Katherine Skollinsberg	Preston Stinger	Natalia Brown	Jennifer Ziebarth	Seishi Yamagata	David McCune	Heidi Spoor	Sara Barker	Eric Rouse	Kory Cox	Mike Digregorio	
Phase 1 - Existing Conditions and Performance Analysis and Preliminary Considerations	\$ 180.07	\$ 98.52	\$ 175.48	\$ 106.19	\$ 153.91	\$ 112.37	\$ 257.60	\$ 223.84	\$ 93.01	\$ 363.68	\$ 133.06	\$ 257.91	
Task 1.1 - Project Management								16	16				120
Task 1.2 - Public and Stakeholder Engagement	72	40						16					156
Task 1.3.1 - Existing TRAX System Performance													360
Task 1.3.2 - Existing TRAX System Ridership and Recent Trends					48							18	138
Task 1.3.3 - Existing TRAX Infrastructure			20			28					16		130
Task 1.3.4 - Existing TRAX Fleet							40						80
Task 1.4 - Summary of Findings and Preliminary Considerations													104
Subtotal Task 1 Hours	72	40	20	0	48	28	40	32	16	0	16	18	1,088
Subtotal Task 1 Labor	\$ 12,965	\$ 3,941	\$ 3,510	\$ -	\$ 7,388	\$ 3,146	\$ 10,304	\$ 7,163	\$ 1,488	\$ -	\$ 2,129	\$ 4,642	\$ 179,348
Phase 2 -													
Task 2.1 - Project Management													96
Task 2.2 - Scenario Development			20										92
Task 2.3 - Scenario Screening					40	20		48			20	16	652
Task 2.4 - Project Identification and Implementation Plan	20				20		64			40			238
Task 2.5 - Public and Stakeholder Engagement	80	40											148
Subtotal Task 2 Hours	100	40	20	0	60	20	64	48	0	40	20	16	1226
Subtotal Task 2 Labor	\$ 18,007	\$ 3,941	\$ 3,510	\$ -	\$ 9,235	\$ 2,247	\$ 16,486	\$ 10,744	\$ -	\$ 14,547	\$ 2,661	\$ 4,127	\$ 213,125
<b>Total Hours</b>	<b>172</b>	<b>80</b>	<b>40</b>	<b>0</b>	<b>108</b>	<b>48</b>	<b>104</b>	<b>80</b>	<b>16</b>	<b>40</b>	<b>36</b>	<b>34</b>	<b>2,314</b>
<b>Total Labor</b>	<b>\$ 30,972</b>	<b>\$ 7,882</b>	<b>\$ 7,019</b>	<b>\$ -</b>	<b>\$ 16,622</b>	<b>\$ 5,394</b>	<b>\$ 26,790</b>	<b>\$ 17,907</b>	<b>\$ 1,488</b>	<b>\$ 14,547</b>	<b>\$ 4,790</b>	<b>\$ 8,769</b>	<b>\$ 392,473</b>

	171.91%						155.44% OH						
Multiplier	3.0454						2.8609						
2019 DL Rate	\$ 56.86	\$ 31.10	\$ 55.40	\$ 33.53	\$ 48.60	\$ 35.48	\$ 86.58	\$ 75.23	\$ 31.26	\$ 122.23	\$ 44.72	\$ 86.68	
2020 Escalation @ 4%	\$ 59.13	\$ 32.35	\$ 57.62	\$ 34.87	\$ 50.54	\$ 36.90	\$ 90.04	\$ 78.24	\$ 32.51	\$ 127.12	\$ 46.51	\$ 90.15	
2020 Loaded Rate	\$ 180.07	\$ 98.52	\$ 175.48	\$ 106.19	\$ 153.91	\$ 112.37	\$ 257.60	\$ 223.84	\$ 93.01	\$ 363.68	\$ 133.06	\$ 257.91	
Total	\$ 12,965.04	\$ 3,940.80	\$ 3,509.60	\$ -	\$ 7,387.68	\$ 3,146.36	\$ 10,304.00	\$ 7,162.88	\$ 1,488.16	\$ -	\$ 2,128.96	\$ 4,642.38	\$ 179,347.60
						\$ 30,949.48					\$ 25,726.38		\$ 3,600.00
													\$ 182,947.60
2019 DL Rate	\$ 56.86	\$ 31.10	\$ 55.40	\$ 33.53	\$ 48.60	\$ 35.48	\$ 86.58	\$ 75.23	\$ 31.26	\$ 122.23	\$ 44.72	\$ 86.68	
2020 Escalation @ 4%	\$ 59.13	\$ 32.35	\$ 57.62	\$ 34.87	\$ 50.54	\$ 36.90	\$ 90.04	\$ 78.24	\$ 32.51	\$ 127.12	\$ 46.51	\$ 90.15	
2020 Loaded Rate	\$ 180.07	\$ 98.52	\$ 175.48	\$ 106.19	\$ 153.91	\$ 112.37	\$ 257.60	\$ 223.84	\$ 93.01	\$ 363.68	\$ 133.06	\$ 257.91	
Total	\$ 18,007.00	\$ 3,940.80	\$ 3,509.60	\$ -	\$ 9,234.60	\$ 2,247.40	\$ 16,486.40	\$ 10,744.32	\$ -	\$ 14,547.20	\$ 2,661.20	\$ 4,126.56	\$ 213,125.14
						\$ 36,939.40					\$ 48,565.68		\$ 3,600.00
													\$ 216,725.14
													74,292.06

TOTAL PRICE \$ 399,672.74

Exhibit B

Costs:

Prices are firm fixed not-to-exceed prices based on substantiation and verification of actual labor hours expended. All costs must be allowable costs under 2 CFR 200.

Payment Schedule

The payments are based on the following schedule:

Billing will be for work performed and satisfactorily completed during time periods as verified and approved by UTA's Project Manager. A billing period shall never be shorter than one month.

Travel Expenses:

Travel Expenses will be billed at cost and will not exceed \$3,600.00 for each phase.

All payments are due in 30 days net from invoice date.

Cost Verification

All payments shall be contingent upon verification by UTA of satisfactory performance by Contractor.