REQUEST FOR PROPOSALS

FEASIBILITY STUDY FOR THE

KAZAKHSTAN RAIL SIGNALING AND TRAIN CONTROL SYSTEMS PROJECT

Submission Deadline: **4:00 PM**

LOCAL TIME

JANUARY 21, 2011

Submission Place:

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SEALED PROPOSALS SHALL BE CLEARLY MARKED AND RECEIVED PRIOR TO THE TIME AND DATE SPECIFIED ABOVE. PROPOSALS RECEIVED AFTER SAID TIME AND DATE WILL NOT BE ACCEPTED OR CONSIDERED.

REQUEST FOR PROPOSALS

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Section 1: INTRODUCTION

The U.S. Trade and Development Agency (USTDA) has provided a grant in the amount of US$655,188 to Kazakhstan Temir Zholy (the "Grantee") in accordance with a grant agreement dated September 10, 2010 (the "Grant Agreement"). This Grant would fund a feasibility study (the "Feasibility Study") on a proposed Rail Signaling and Train Control Systems project (the "Project") in Kazakhstan (the "Host Country").The Grant Agreement is attached at Annex 4 for reference. The Grantee is soliciting technical proposals from qualified U.S. firms to provide expert consulting services to perform the Feasibility Study.

1.1 BACKGROUND SUMMARY

The Kazakhstan railway sector plays a significant role in the economy. It is a critical mode of transport. This is especially true in the extractive and agricultural sectors, which require bulk cargoes to be moved with the most efficiency possible over great distances internally and subsequently to export markets. In 2007, KTZ moved over 200 billion ton/km of cargo.

The Kazakhstan railway system (15,082 total kilometers of track of which 3,700 is electrified) is dominated by KTZ, a state owned rail sector enterprise with numerous subsidiaries. KTZ is owned by Samruk-Kazyna "National Welfare Fund", a government-controlled holding company with controlling stakes in many industrial sectors in the nation. KTZ is undergoing a process of restructuring along lines of business broadly based on the European model of separation of freight and passenger service from infrastructure management. The intent is to develop some level of competition in different areas, including provision of transportation as well as auxiliary support services. This will prepare local railway businesses to face international competition entering the domestic market (beginning already in provision of wagons), as well as to expand into the regional market.

Following a significant drop in traffic due to the economic disruptions and re-alignments that occurred with the fall of the Soviet Union – and a subsequent decade of minimal investment - Kazakhstan has begun building up its railway infrastructure again. The wagon fleet is large, old and inefficient and requires substantial investment and rebalancing of the mix of wagon types based on current and future traffic demand. Likewise, much of the elderly Soviet era locomotive equipment is beyond its expected service life. An ambitious railway development effort is planned through 2020. This plan is a comprehensive recapitalization of the system valued at nearly USD $23 billion and includes some new lines and services as well as operational changes and significant investments in information technology and traffic control systems.

Traffic control and signaling systems support safety of train operations, serve to manage the traffic capacity of the infrastructure and increasingly serve to aid in management of the health and condition of rolling stock and infrastructure. Presently the major railway corridors in Kazakhstan are controlled using legacy Soviet Union-era electric automated block signal systems. These systems are outdated and costly to maintain, and KTZ has assessed that they will be inefficient to support the capacity needed for projected future traffic levels and characteristics.

The proposed feasibility study would examine signaling system enhancement for three railway corridor segments ("corridors") that KTZ considers representative of the national network. These corridors are from Shymkent to Qazaly (792 km), Qazaly to Qandyaghash (615.8 km), and Almaty to Aqtoghay (471.9 km). This feasibility study will assess the potential usage of Centralized Traffic Control (CTC) and Advanced Train Control Systems (ATCS) for the above listed track segments. KTZ is planning to begin installation of these systems on the three listed track segments, and then expand its selected train control system to the entire rail network.

Excerpts from a background Definitional Mission are provided for reference in Annex 2.

1.2 OBJECTIVE

This $655,188 feasibility study grant will fund an evaluation of train control and rail signaling systems in Kazakhstan. The FS will study three rail corridors (from Shymkent to Qazaly, Qazaly to Qandyaghash, and Almaty to Aqtoghay), and will evaluate the different potential train control systems that each line may need. The Terms of Reference (TOR) for this Feasibility Study are attached as Annex 5.

1.3 PROPOSALS TO BE SUBMITTED

Technical proposals are solicited from interested and qualified U.S. firms. The administrative and technical requirements as detailed throughout the Request for Proposals (RFP) will apply. Specific proposal format and content requirements are detailed in Section 3.

The amount for the contract has been established by a USTDA grant of US$655,188. **The USTDA grant of $US655,188 is a fixed amount. Accordingly, COST will not be a factor in the evaluation and therefore, cost proposals should not be submitted**. Upon detailed evaluation of technical proposals, the Grantee shall select one firm for contract negotiations.

1.4 CONTRACT FUNDED BY USTDA

In accordance with the terms and conditions of the Grant Agreement, USTDA has provided a grant in the amount of US$655,188 to the Grantee. The funding provided under the Grant Agreement shall be used to fund the costs of the contract between the Grantee and the U.S. firm selected by the Grantee to perform the TOR. The contract must include certain USTDA Mandatory Contract Clauses relating to nationality, taxes, payment, reporting, and other matters. The USTDA nationality requirements and the USTDA Mandatory Contract Clauses are attached at Annexes 3 and 4, respectively, for reference.

Section 2: INSTRUCTIONS TO OFFERORS

2.1 PROJECT TITLE

The project is called the Kazakhstan Rail Signaling and Train Control Systems Feasibility Study.

2.2 DEFINITIONS

Please note the following definitions of terms as used in this RFP.

The term "Request for Proposals" means this solicitation of a formal technical proposal, including qualifications statement.

The term "Offeror" means the U.S. firm, including any and all subcontractors, which responds to the RFP and submits a formal proposal and which may or may not be successful in being awarded this procurement.

2.3 EXCERPTS FROM DEFINITIONAL MISSION REPORT

USTDA sponsored a Definitional Mission to address technical, financial, sociopolitical, environmental and other aspects of the proposed project. Excerpts of the report are attached at Annex 2 for background information only. Please note that the TOR referenced in the report are included in this RFP as Annex 5.

2.4 EXAMINATION OF DOCUMENTS

Offerors should carefully examine this RFP. It will be assumed that Offerors have done such inspection and that through examinations, inquiries and investigation they have become familiarized with local conditions and the nature of problems to be solved during the execution of the Feasibility Study.

Offerors shall address all items as specified in this RFP. Failure to adhere to this format may disqualify an Offeror from further consideration.

Submission of a proposal shall constitute evidence that the Offeror has made all the above mentioned examinations and investigations, and is free of any uncertainty with respect to conditions which would affect the execution and completion of the Feasibility Study.

2.5 PROJECT FUNDING SOURCE

The Feasibility Study will be funded under a grant from USTDA. The total amount of the grant is not to exceed US$655,188.

2.6 RESPONSIBILITY FOR COSTS

Offeror shall be fully responsible for all costs incurred in the development and submission of the proposal. Neither USTDA nor the Grantee assumes any obligation as a result of the issuance of this RFP, the preparation or submission of a proposal by an Offeror, the evaluation of proposals, final selection or negotiation of a contract.

2.7 TAXES

Offerors should submit proposals that note that in accordance with the USTDA Mandatory Contract Clauses, USTDA grant funds shall not be used to pay any taxes, tariffs, duties, fees or other levies imposed under laws in effect in the Host Country.

2.8 CONFIDENTIALITY

The Grantee will preserve the confidentiality of any business proprietary or confidential information submitted by the Offeror, which is clearly designated as such by the Offeror, to the extent permitted by the laws of the Host Country.

2.9 ECONOMY OF PROPOSALS

Proposal documents should be prepared simply and economically, providing a comprehensive yet concise description of the Offeror's capabilities to satisfy the requirements of the RFP. Emphasis should be placed on completeness and clarity of content.

2.10 OFFEROR CERTIFICATIONS

The Offeror shall certify (a) that its proposal is genuine and is not made in the interest of, or on behalf of, any undisclosed person, firm, or corporation, and is not submitted in conformity with, and agreement of, any undisclosed group, association, organization, or corporation; (b) that it has not directly or indirectly induced or solicited any other Offeror to put in a false proposal; (c) that it has not solicited or induced any other person, firm, or corporation to refrain from submitting a proposal; and (d) that it has not sought by collusion to obtain for itself any advantage over any other Offeror or over the Grantee or USTDA or any employee thereof.

2.11 CONDITIONS REQUIRED FOR PARTICIPATION

Only U.S. firms are eligible to participate in this tender. However, U.S. firms may utilize subcontractors from the Host Country for up to 20 percent of the amount of the USTDA grant for specific services from the TOR identified in the subcontract. USTDA's nationality requirements, including definitions, are detailed in Annex 3.

2.12 LANGUAGE OF PROPOSAL

All proposal documents shall be prepared and submitted in English and in Russian.

2.13 PROPOSAL SUBMISSION REQUIREMENTS

The **Cover Letter** in the proposal must be addressed to:

Mr. Tulbai Abdiev
Chief Engineer
National Company "Kazakhstan Temir Zholy"
#6 Konaev Street
010000 Astana
Republic of Kazakhstan

An Original, four (4) Russian language and four (4) English language copies of your proposal must be received at the above address no later than 4:00, on January 21, 2011.

Proposals may be either sent by mail, overnight courier, or hand-delivered. Whether the proposal is sent by mail, courier or hand-delivered, the Offeror shall be responsible for actual delivery of the proposal to the above address before the deadline. Any proposal received after the deadline will be returned unopened. The Grantee will promptly notify any Offeror if its proposal was received late.

Upon timely receipt, all proposals become the property of the Grantee.

2.14 PACKAGING

The original and each copy of the proposal must be sealed to ensure confidentiality of the information. The proposals should be individually wrapped and sealed, and labeled for content including "original" or "copy number x"; the original and eight (8) copies should be collectively wrapped and sealed, and clearly labeled.

Neither USTDA nor the Grantee will be responsible for premature opening of proposals not properly wrapped, sealed and labeled.

2.15 AUTHORIZED SIGNATURE

The proposal must contain the signature of a duly authorized officer or agent of the Offeror empowered with the right to bind the Offeror.

2.16 EFFECTIVE PERIOD OF PROPOSAL

The proposal shall be binding upon the Offeror for NINETY (90) days after the proposal due date, and Offeror may withdraw or modify this proposal at any time prior to the due date upon written request, signed in the same manner and by the same person who signed the original proposal.

2.17 EXCEPTIONS

All Offerors agree by their response to this RFP announcement to abide by the procedures set forth herein. No exceptions shall be permitted.

2.18 OFFEROR QUALIFICATIONS

As provided in Section 3, Offerors shall submit evidence that they have relevant past experience and have previously delivered advisory, feasibility study and/or other services similar to those required in the TOR, as applicable.

2.19 RIGHT TO REJECT PROPOSALS

The Grantee reserves the right to reject any and all proposals.

2.20 PRIME CONTRACTOR RESPONSIBILITY

Offerors have the option of subcontracting parts of the services they propose. The Offeror's proposal must include a description of any anticipated subcontracting arrangements, including the name, address, and qualifications of any subcontractors. USTDA nationality provisions apply to the use of subcontractors and are set forth in detail in Annex 3. The successful Offeror shall cause appropriate provisions of its contract, including all of the applicable USTDA Mandatory Contract Clauses, to be inserted in any subcontract funded or partially funded by USTDA grant funds.

2.21 AWARD

The Grantee shall make an award resulting from this RFP to the best qualified Offeror, on the basis of the evaluation factors set forth herein. The Grantee reserves the right to reject any and all proposals received and, in all cases, the Grantee will be the judge as to whether a proposal has or has not satisfactorily met the requirements of this RFP.

2.22 COMPLETE SERVICES

The successful Offeror shall be required to (a) provide local transportation, office space and secretarial support required to perform the TOR if such support is not provided by the Grantee; (b) provide and perform all necessary labor, supervision and services; and (c) in accordance with best technical and business practice, and in accordance with the requirements, stipulations, provisions and conditions of this RFP and the resultant contract, execute and complete the TOR to the satisfaction of the Grantee and USTDA.

2.23 INVOICING AND PAYMENT

Deliverables under the contract shall be delivered on a schedule to be agreed upon in a contract with the Grantee. The Contractor may submit invoices to the designated Grantee Project Director in accordance with a schedule to be negotiated and included in the contract. After the Grantee's approval of each invoice, the Grantee will forward the invoice to USTDA. If all of the requirements of USTDA's Mandatory Contract Clauses are met, USTDA shall make its respective disbursement of the grant funds directly to the U.S. firm in the United States. All payments by USTDA under the Grant Agreement will be made in U.S. currency. Detailed provisions with respect to invoicing and disbursement of grant funds are set forth in the USTDA Mandatory Contract Clauses attached in Annex 4.

Section 3: PROPOSAL FORMAT AND CONTENT

To expedite proposal review and evaluation, and to assure that each proposal receives the same orderly review, all proposals must follow the format described in this section.

Proposal sections and pages shall be appropriately numbered and the proposal shall include a Table of Contents. Offerors are encouraged to submit concise and clear responses to the RFP. Proposals shall contain all elements of information requested without exception. Instructions regarding the required scope and content are given in this section. The Grantee reserves the right to include any part of the selected proposal in the final contract.

The proposal shall consist of a technical proposal only. A cost proposal is NOT required because the amount for the contract has been established by a USTDA grant of US$655,188, which is a fixed amount.

Offerors shall submit one (1) original and eight (8) copies of the proposal. Proposals received by fax cannot be accepted.

Each proposal must include the following:

Transmittal Letter,
Cover/Title Page,
Table of Contents,
Executive Summary,
Company Information,
Organizational Structure, Management Plan, and Key Personnel,
Technical Approach and Work Plan, and
Experience and Qualifications.

Detailed requirements and directions for the preparation of the proposal are presented below.

3.1 EXECUTIVE SUMMARY

An Executive Summary should be prepared describing the major elements of the proposal, including any conclusions, assumptions, and general recommendations the Offeror desires to make. Offerors are requested to make every effort to limit the length of the Executive Summary to no more than five (5) pages.

3.2 COMPANY INFORMATION

For convenience, the information required in this Section 3.2 may be submitted in the form attached in Annex 6 hereto.

3.2.1 Company Profile

Provide the information listed below relative to the Offeror's firm. If the Offeror is proposing to subcontract some of the proposed work to another firm(s), the information below must be provided for each subcontractor.

1. Name of firm and business address (street address only), including telephone and fax numbers.

2. Year established (include predecessor companies and year(s) established, if appropriate).

3. Type of ownership (e.g. public, private or closely held).

4. If private or closely held company, provide list of shareholders and the percentage of their ownership.

5. List of directors and principal officers (President, Chief Executive Officer, Vice-President(s), Secretary and Treasurer; provide full names including first, middle and last). Please place an asterisk (*) next to the names of those principal officers who will be involved in the Feasibility Study.

6. If Offeror is a subsidiary, indicate if Offeror is a wholly-owned or partially-owned subsidiary. Provide the information requested in items 1 through 5 above for the Offeror’s parent(s).

7. Project Manager's name, address, telephone number, e-mail address and fax number .

3.2.2 Offeror's Authorized Negotiator

Provide name, title, address, telephone number, e-mail address and fax number of the Offeror's authorized negotiator. The person cited shall be empowered to make binding commitments for the Offeror and its subcontractors, if any.

3.2.3 Negotiation Prerequisites

1. Discuss any current or anticipated commitments which may impact the ability of the Offeror or its subcontractors to complete the Feasibility Study as proposed and reflect such impact within the project schedule.

2. Identify any specific information which is needed from the Grantee before commencing contract negotiations.

3.2.4 Offeror's Representations

If any of the following representations cannot be made, or if there are exceptions, the Offeror must provide an explanation.

1. Offeror is a corporation *[insert applicable type of entity if not a corporation]* duly organized, validly existing and in good standing under the laws of the State of _____. The Offeror has all the requisite corporate power and authority to conduct its business as presently conducted, to submit this proposal, and if selected, to execute and deliver a contract to the Grantee for the performance of the Feasibility Study. The Offeror is not debarred, suspended, or to the best of its knowledge or belief, proposed for debarment, or ineligible for the award of contracts by any federal or state governmental agency or authority. The Offeror has included, with this proposal, a certified copy of its Articles of Incorporation, and a certificate of good standing issued within one month of the date of its proposal by the State of _____.

2. Neither the Offeror nor any of its principal officers have, within the three-year period preceding this RFP, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a federal, state or local government contract or subcontract; violation of federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, violating federal or state criminal tax laws, or receiving stolen property.

3. Neither the Offeror, nor any of its principal officers, is presently indicted for, or otherwise criminally or civilly charged with, commission of any of the offenses enumerated in paragraph 2 above.

4. There are no federal or state tax liens pending against the assets, property or business of the Offeror. The Offeror, has not, within the three-year period preceding this RFP, been notified of any delinquent federal or state taxes in an amount that exceeds $3,000 for which the liability remains unsatisfied. Taxes are considered delinquent if (a) the tax liability has been fully determined, with no pending administrative or judicial appeals; and (b) a taxpayer has failed to pay the tax liability when full payment is due and required.

5. The Offeror has not commenced a voluntary case or other proceeding seeking liquidation, reorganization or other relief with respect to itself or its debts under any bankruptcy, insolvency or other similar law. The Offeror has not had filed against it an involuntary petition under any bankruptcy, insolvency or similar law.

The selected Offeror shall notify the Grantee and USTDA if any of the representations included in its proposal are no longer true and correct at the time of its entry into a contract with the Grantee. USTDA retains the right to request an updated certificate of good standing from the selected Offeror.

3.3 ORGANIZATIONAL STRUCTURE, MANAGEMENT, AND KEY PERSONNEL

Describe the Offeror's proposed project organizational structure. Discuss how the project will be managed including the principal and key staff assignments for this Feasibility Study. Identify the Project Manager who will be the individual responsible for this project. The Project Manager shall have the responsibility and authority to act on behalf of the Offeror in all matters related to the Feasibility Study.

Provide a listing of personnel (including subcontractors) to be engaged in the project, including both U.S. and local subcontractors, with the following information for key staff: position in the project; pertinent experience, curriculum vitae; other relevant information. If subcontractors are to be used, the Offeror shall describe the organizational relationship, if any, between the Offeror and the subcontractor.

A manpower schedule and the level of effort for the project period, by activities and tasks, as detailed under the Technical Approach and Work Plan shall be submitted. A statement confirming the availability of the proposed project manager and key staff over the duration of the project must be included in the proposal.

3.4 TECHNICAL APPROACH AND WORK PLAN

Describe in detail the proposed Technical Approach and Work Plan (the “Work Plan”). Discuss the Offeror’s methodology for completing the project requirements. Include a brief narrative of the Offeror’s methodology for completing the tasks within each activity series. Begin with the information gathering phase and continue through delivery and approval of all required reports.

Prepare a detailed schedule of performance that describes all activities and tasks within the Work Plan, including periodic reporting or review points, incremental delivery dates, and other project milestones.

Based on the Work Plan, and previous project experience, describe any support that the Offeror will require from the Grantee. Detail the amount of staff time required by the Grantee or other participating agencies and any work space or facilities needed to complete the Feasibility Study.

3.5 SECTION 5: EXPERIENCE AND QUALIFICATIONS

Provide a discussion of the Offeror's experience and qualifications that are relevant to the objectives and TOR for the Feasibility Study. If a subcontractor(s) is being used, similar information must be provided for the prime and each subcontractor firm proposed for the project. The Offeror shall provide information with respect to relevant experience and qualifications of key staff proposed. The Offeror shall include letters of commitment from the individuals proposed confirming their availability for contract performance.

As many as possible but not more than six (6) relevant and verifiable project references must be provided for the Offeror and any subcontractor, including the following information:

Project name,
Name and address of client (indicate if joint venture),
Client contact person (name/ position/ current phone and fax numbers),
Period of Contract,
Description of services provided,
Dollar amount of Contract, and
Status and comments.

Offerors are strongly encouraged to include in their experience summary primarily those projects that are similar to or larger in scope than the Feasibility Study as described in this RFP.

Section 4: AWARD CRITERIA

Individual proposals will be initially evaluated by a Procurement Selection Committee of representatives from the Grantee. The Committee will then conduct a final evaluation and completion of ranking of qualified Offerors. The Grantee will notify USTDA of the best qualified Offeror, and upon receipt of USTDA's no-objection letter, the Grantee shall promptly notify all Offerors of the award and negotiate a contract with the best qualified Offeror. If a satisfactory contract cannot be negotiated with the best qualified Offeror, negotiations will be formally terminated. Negotiations may then be undertaken with the second most qualified Offeror and so forth.

The selection of the Contractor will be based on the following criteria:

1. **Technical Experience (45 points):** Firm and team experience in feasibility studies on, or management of implementation of, similar projects involving railway signaling and traffic control. Demonstrable understanding of the newest technologies in this field, particularly advanced train control technologies, such as the use of wireless communications links for transmission of safety critical data in train control systems and also rail traffic operations simulation and modeling. Inclusion of senior individuals with direct management experience in train operations or signaling & communication departments of a railroad of comparable size is key, notably personnel having held such responsibilities for both passenger and freight operations.

2. **Work Plan and Methodology (25 points):** Adequacy of the proposed work plan and suggested overall approach in responding to the Terms of Reference. Soundness and thoroughness of the technical approach and work plan detailed in the proposal and the overall quality of the presentation should be evaluated. The proposal should provide an organization chart of key personnel with their qualifications and a staffing schedule for each key activity.

3. **Capital Project Bidding Documentation (10 points):** Firm and team experience in developing bidding documents for railway infrastructure and rolling stock, particularly for railway signaling and traffic control systems. Demonstrated experience with international competitive bidding and the requirements of multilateral lending institutions is preferred.

4. **Regional Experience (20 points):** Firm and team's familiarity with the railway sector in the Former Soviet Union (FSU) countries including local and international conditions, regulations and requirements. The firm and team should demonstrate familiarity with both Russian and European regulations, requirements and standards for railway signaling and traffic control. The firm experience should include significant relevant projects successfully carried out in the FSU region within the past five years.

Proposals that do not include all requested information may be considered non-responsive.
Price will not be a factor in contractor selection.

ANNEX 1

TULBAI ABDIEV, CHIEF ENGINEER, NATIONAL COMPANY "KAZAKHSTAN TEMIR ZHOLY", #6 KONAEV STREET, 010000 ASTANA, REPUBLIC OF KAZAKHSTAN

B –KAZKAHSTAN: RAIL SIGNALING AND TRAIN CONTROL SYSTEMS PROJECT

POC Nina Patel, USTDA, 1000 Wilson Boulevard, Suite 1600, Arlington, VA 22209-3901, Tel: (703) 875-4357, Fax: (703) 875-4009. KAZKAHSTAN: RAIL SIGNALING AND TRAIN CONTROL SYSTEMS. The Grantee invites submission of qualifications and proposal data (collectively referred to as the "Proposal") from interested U.S. firms which are qualified on the basis of experience and capability to develop a feasibility study to:

1. Evaluate the current status of KTZ's Rail signaling and train control systems;
2. Evaluate current technologies to determine the best fit for KTZ's current and future train control and rail signaling plans;
3. Develop technical specifications for updating KTZ's equipment on a system wide or rail corridor by corridor basis;
4. Develop cost estimates of the above recommended systems.

Kazakhstan Temir Zholy "Kazakhstan Railways" is engaged in an aggressive plan of railway development. A primary objective of this plan is to improve capacity on major corridors throughout the country, in particular to support domestic export and transit freight traffic growth taking advantage of KTZ's strategic "crossroads" position in Central Asia. In parallel, significant investment is underway and planned to improve and increase railway passenger service as demand for service presently outstrips supply and service quality requires improvement. KTZ anticipates most major lines in the country will continue to carry mixed passenger and freight traffic and they intend to bring peak speeds on main corridors from a present 140 kilometers per hour on main lines up to 160 and ultimately to 200 kilometers per hour. From a control, safety and capacity perspective these goals will be a technical challenge to achieve. Presently the major railway corridors in Kazakhstan are controlled using legacy Soviet Union-era electric automated block signal systems. These systems are outdated, costly to maintain and KTZ has assessed that they will be inefficient to support the capacity needs in accordance with projected future traffic levels and characteristics. The feasibility study will assess rail signaling and train control systems upgrades for three rail corridors on KTZ's railway network that are representative of the entire network.

The U.S. firm selected will be paid in U.S. dollars from a $655,188 grant to the Grantee from the U.S. Trade and Development Agency (USTDA).

A detailed Request for Proposals (RFP), which includes requirements for the Proposal, the Terms of Reference, and a background definitional mission report are available from USTDA, at 1000 Wilson Boulevard, Suite 1600, Arlington, VA 22209-3901. To request the RFP in PDF format, please go to: https://www.ustda.gov/USTDA/FedBizOpps/RFP/rfpform.asp. Requests for a mailed hardcopy version of the RFP may also be faxed to the IRC, USTDA at 703-875-4009. In the fax, please include your firm's name, contact person, address, and telephone number. Some firms have found that RFP materials sent by U.S. mail do not reach them in time for preparation of an adequate response. Firms that want USTDA to use an overnight delivery service should include the name of the delivery service and your firm's account number in the request for the

RFP. Firms that want to send a courier to USTDA to retrieve the RFP should allow one hour after faxing the request to USTDA before scheduling a pick-up. Please note that no telephone requests for the RFP will be honored. Please check your internal fax verification receipt. Because of the large number of RFP requests, USTDA cannot respond to requests for fax verification. Requests for RFPs received before 4:00 PM will be mailed the same day. Requests received after 4:00 PM will be mailed the following day. Please check with your courier and/or mail room before calling USTDA.

Only U.S. firms and individuals may bid on this USTDA financed activity. Interested firms, their subcontractors and employees of all participants must qualify under USTDA's nationality requirements as of the due date for submission of qualifications and proposals and, if selected to carry out the USTDA-financed activity, must continue to meet such requirements throughout the duration of the USTDA-financed activity. All goods and services to be provided by the selected firm shall have their nationality, source and origin in the U.S. or host country. The U.S. firm may use subcontractors from the host country for up to 20 percent of the USTDA grant amount. Details of USTDA's nationality requirements and mandatory contract clauses are also included in the RFP.

Interested U.S. firms should submit their Proposal in English and Russian directly to the Grantee by 4:00 PM, JANUARY 21, 2011 at the above address. Evaluation criteria for the Proposal are included in the RFP. Requests for clarification on any aspect of the RFP should be directed to POC Nina Patel, USTDA, 1000 Wilson Boulevard, Suite 1600, Arlington, VA 22209-3901, Tel: (703) 875-4357, Fax: (703) 875-4009. Any such request must be received no later than 4:00 PM, JANUARY 21, 2011, in order to be .honored. Price will not be a factor in contractor selection, and therefore, cost proposals should NOT be submitted. The Grantee reserves the right to reject any and/or all Proposals. The Grantee also reserves the right to contract with the selected firm for subsequent work related to the project. The Grantee is not bound to pay for any costs associated with the preparation and submission of Proposals

A N N E X 2

REPUBLIC OF KAZAKHSTAN

Kazakhstan is a country of 15.4 million people and 2.7 million square kilometers located in Central Asia. It is bordered by China (1,533 km) Kyrgyzstan (1,224 km) Russia (6,846 km) Turkmenistan (379 km) Uzbekistan (2,203 km) and the Caspian Sea (1,894 km). Kazakhstan is landlocked and has unresolved transnational boundary issues with several of its neighbors.

The Kazakhstan railway sector plays a significant role in the economy. It is a critical mode of transport particularly for freight traffic, notably in the extractive and agricultural sectors, which require bulk cargoes to be moved with the most efficiency possible over great distances internally and subsequently to export markets. The chart provided ranks Kazakhstan's trade flows by top partners; trade is dominated by Russia, China and the European Union. US trade with Kazakhstan while not insignificant is limited with $985.5 million in exports to Kazakhstan reported in 2008 and $1.6 billion in imports.

Kazakhstan Trade by Value, 2008							
Exports				Imports			
Partners	% Value	$	43,960,000,000	Partners	% Value	$	38,450,000,000
China*	13.4%	$	5,890,640,000	Russia	34.0%	$	14,946,400,000
Russia	11.1%	$	4,879,560,000	China*	25.0%	$	10,990,000,000
Germany*	10.6%	$	4,659,760,000	Germany*	6.2%	$	2,725,520,000
Italy*	6.9%	$	3,033,240,000	Ukraine	4.7%	$	2,066,120,000
Romania*	6.6%	$	2,901,360,000				
France*	5.7%	$	2,505,720,000				
Ukraine	5.4%	$	2,373,840,000				
Turkey*	4.1%	$	1,802,360,000				
Cumulative	**63.8%**	**$**	**28,046,480,000**		**69.9%**	**$**	**30,728,040,000**
USA	3.6%	$	1,600,000,000	USA	2.6%	$	985,500,000

** Break in railway gauge for overland route.*

Russia and Kazakhstan announced their launch of a customs union in early July. Ultimately intended to also include Belarus this will create a common trade area including over 160 million people. While still a work in progress it is likely that it will serve to strengthen commercial ties and trade flows between Russia and Kazakhstan.

The Kazakhstan railway system is dominated by Kazakhstan Temir Zholy (KTZ) a state owned enterprise with numerous subsidiaries. KTZ is correspondingly owned by Samruk-Kazyna "National Welfare Fund" a massive government controlled holding company with controlling

stakes in nearly all significant industry in the nation. KTZ is undergoing a process of restructuring along railway lines of business broadly based on the European model of separation of freight and passenger service from infrastructure management. The intent is to develop some level of competition in different areas including provision of transportation as well as auxiliary support services. This will prepare local railway businesses to face international competition (beginning already in provision of wagons) entering the domestic market as well as to expand respectively into the regional market. KTZ faces many major challenges in continuing this restructuring, albeit challenges that have been faced by most restructured state railways worldwide, with varying degrees of success.

Recently built 35-story headquarters of KTZ in Central Astana.

The railway network consists of 15,082 kilometers of broad gauge (1,520 mm) lines. Of this, 3,700 kilometers is electrified providing 25kV AC traction power through overhead lines. It should be noted that where a break in gauge exists significant transit time and costs are added to railway transport between countries as either trans-loading of railway cargoes must occur or wagons must be transferred onto different gauge bogies to continue the journey.

Table: Main KTZ Corporate Divisions	
1. Main Network Management	7. Information-analytical Center
2. Transportation Process Management	8. Designing and Capital Construction
3. Transportations Control Center	9. Research & Development Center
4. Estimation/Personnel Dev. Center	10. Main Communication Control Center
5. Economic Management	11. Processing Center
6. Main Computer Center	12. Informational Service

Table: Representative KTZ Components	
KTZ Subsidiary/Affiliate	**Role**
1. JSC “Locomotive”	Provision of motive power for road haul and switching services.
2. JSC “Locomotivnyi servisnyi center”	Locomotive rolling stock management, maintenance and repair.

Table: Representative KTZ Components	
KTZ Subsidiary/Affiliate	**Role**
3. JSC “Kaztemirtrans”	Freight wagon fleet management and forwarding including military and hazardous cargoes.
4. JSC “Temirsholsu”	Maintenance and management of water systems, sanitation and waste disposal.
5. JSC “Temirsholshylu”	Maintenance and management of fuel and water systems and networks.
6. JSC “Temirzhol zhondeu”	Railway infrastructure construction and maintenance.
7. JSC “Kaztransservis”	Cargo transportation planning, intermodal management, repair of intermodal containers and hazardous materials wagons.
8. JSC “Transtelecom”	Responsible for management and development of communications systems and services along right-of-way and elsewhere.
9. JSC “Tsenter trasportnogo servisa”	Management of railway network service roads.
10. JSC “Passazhirskie perevozki”	Organization and maintenance of passenger rail transportation, luggage transportations, freight and items of mail in republican, suburban and international messages.
11. JSC “Kedentransservis”	1) cargo handling works, crane works; 2) transportation of cargoes; 3) rendering of broker services, customs registration and storage of cargoes.
12. JSC “Voenizirovannaya zheleznodorozhnaya okhrana”	Railway cargo security, specific functions for domestic and international military cargoes.
13. JSC “Almatinskii vagonoremontnyi zavod”	1) manufacturing and repair of a railway rolling stock; 2) manufacture and restoration of spare parts, units of the capital equipment for a railway rolling stock.
14. JSC “Kaskor-Transservis”	1) freight and passenger transportation service by railway and road; 2) forwarding service; 3) services of communication; 4) repair and construction of tracks, arrangement of signalization centralization blocking and communications.
15. Open JSC “Zheldorvodoteplosnabzhenie”	Steam heat and water utility company, under liquidation due to enterprise restructuring.
16. JSC “Remlocomotiv”	Locomotive repair company under liquidation due to enterprise restructuring
17. Open JSC “Zheldorremmash”	Under liquidation due to enterprise restructuring
18. JSC “Remvagon”	Car repair company under liquidation due to enterprise restructuring
19. “Lesozashita” Ltd.	Landscaping and forestry services.

Table: Representative KTZ Components	
KTZ Subsidiary/Affiliate	**Role**
20. “Ertys servis” Ltd.	Washing and repair of petroleum product railway tank wagons.
21. “Kazygurt-Iug” Ltd.	
22. “Akzhaiyk-Zapad 2006”	

The network generally has its strongest linkages running north to south and in the eastern-northeastern regions of the country, a legacy of Russian influence on development of the transport system. Following a massive drop in traffic due to the economic disruptions and re-alignments that occurred with the fall of the Soviet Union – and a subsequent decade of minimal investment - Kazakhstan has begun slowly building up its railway infrastructure again. The wagon fleet is large, old and inefficient and requires substantial investment and rebalancing of the mix wagon types based on current and future traffic demand. Likewise much of the motive power fleet is elderly Soviet era equipment that is beyond its expected service life. These deficiencies in the rolling stock fleet and other aspects of the system are in part to be addressed by the aggressive recent strategic moves to undertake large scale equipment purchases and to initiate joint equipment manufacturing projects with major multinational firms including Talgo, Alstom, Transmashholdings and General Electric.

- **Alstom-Transmashholding:** In June of 2010 the government of Kazakhstan agreed to a joint venture with these firms (French and Russian, respectively) to begin construction of an electric locomotive manufacturing plant in Astana with production beginning in 2012. The facility will produce a wide-gauge version of Alstom’s PRIMA 6000 locomotive, an advanced electric locomotive adaptable for passenger and freight service and capable of operations under four common types of traction power (25 kV, 15 kV, 1,500 V and 3,000 V) used in Europe and Asia. This locomotive will be used for domestic service and also for export to Europe and Asia. Alstom is now a part owner of Transmash having purchased one quarter of the shares for $75 million and joint venture entity Tekhnologii Relsovogo Transporta has been established for vehicle development.

- **Talgo:** In June of 2010 the government of Kazakhstan signed an agreement with Talgo of Spain to build and maintain up to 150 passenger railcars per year. These wagons will be used for domestic service and for export to Europe and Asia.

- **Ansaldo:** The joint venture between KTZ and Ansaldo STS (daughter company of Italian industrial conglomerate Finmeccanica) in 2010 was awarded a EURO 70m contract to install a signaling and communications system along the 293 km Zhetigan – Korgas railway line running to China.

- **General Electric:** A joint venture with KTZ will build broad gauge diesel and AC electric shunting (switching) locomotives. An initial order of 150, the majority fabricated in the US and assembled in Kazakhstan, will be destined for domestic use and also export to Europe and Asia.

- The German industrial conglomerate **Siemens A.G.** also just announced a Memorandum of Collaboration with KTZ that Siemens claims could be worth up to 400 million Euros for traction power systems for passenger locomotives as well as railway signaling and control systems. Siemens has been investing in Kazakhstan for over a decade in various sectors and aggressively developing a local workforce which now numbers over 200 persons. They previously supplied 22 passenger locomotives to KTZ under a 33 million Euro contract that includes the unit sales and ongoing maintenance services.

Republic of Kazakhstan Railway System Statistics						
	2003	2004	2005	2006	2007	% Chg.
Network Route Kilometers	14,648	15,081	15,021	15,082	15,082	3%
Total Locomotives	1,770	1,711	1,659	1,695	1,715	-3%
Total Freight wagons	70,366	60,792	56,843	56,895	61,523	-13%
Total Passenger Wagons	2,694	2,022	1,974	2,886	2,855	6%
Freight Ton-Kilometers	147,700,000,000	163,500,000,000	171,900,000,000	191,200,000,000	200,800,000,000	36%
Passenger Kilometers	10,700,000,000	11,800,000,000	12,100,000,000	13,700,000,000	14,600,000,000	36%

Following an initial restructuring begun in 2001 Kazakhstan has sought to improve the railway institutional structure and operate along more commercial principles. They have found this challenging as they attempt to balance these initiatives with various social policy goals. One of these is subsidization of transport tariffs which limits the ability of the enterprise to self-finance capital improvements to the levels that would be expected of a more market-based system. Another goal is high employment promotion; this is followed aggressively at KTZ with nearly 150,000 employees in the group. This is approximately 88% of the number of employees for all the major US (Class I) freight railroads and Amtrak combined.

An ambitious railway development effort is planned through 2020. This plan is a comprehensive recapitalization of the system valued at nearly USD $23 billion and includes some new lines and services as well as operational changes and significant investments in information technology and traffic control systems.

KTZ Detail of Capital Plan 2010 - 2020		
Project Title	**%**	**Total 2010 - 20**
Renovation of locomotives stock	33.5%	$ 7,678,880,786
Other projects	19.1%	$ 4,364,040,877
Major repair of superstructure, km	18.3%	$ 4,191,703,255
Renovation of freight wagons stock	12.9%	$ 2,960,667,112
Construction of Khorgas - Zhetyghen Railroad	4.2%	$ 965,258,010
Mod. Of electric interlocking, CTC, hump interlocking & traction power control substations.	3.2%	$ 731,048,083
Construction of Engineering Structures, Units	2.0%	$ 459,726,917
Purchase of track maintenance machinery, running stock, equipment, mechanical means, units.	1.7%	$ 400,020,995
Construction: Uzen State Turkmenistan Bdr. RR.	1.7%	$ 383,093,341
Renovation of passenger coaches stock	1.4%	$ 324,552,886
Informatization, automation and telecommunication development	1.3%	$ 306,814,943
Modernization of Mangyshlak-Ushen Section	0.3%	$ 70,077,279
Electrification of Kostanai-Zhelezorudnaya Section	0.1%	$ 33,030,315
Renovation of containers stock	0.1%	$ 24,507,151
Electrification of tracks at the Almaty-1 station	0.0%	$ 977,306
Totals	**100%**	**$ 22,894,399,256**

The Seneca team met with officials from the Samruk-Kazyna (national industrial holding company), the Ministry of Transport and officials and technical personnel from Kazakhstan Temir Zholy (KTZ). The meetings with S-K and the Ministry of Transport appeared to conducted as formalities and the officials involved although cordial had little interest in the DM and seemed to be holding the meetings as a courtesy. Generally and particularly regarding KTZ we did not consider the time spent in meetings with officials, nor the substance of those meetings, to be sufficient to develop proper Terms of Reference for strong USTDA grant financed projects. Our primary contact was unexpectedly called to travel to Moscow on our first day of meetings and did not return until the end of the week and then only could participate in a meeting lasting less than an hour. In the absence of their senior executive KTZ personnel appeared hesitant to have any substantive discussions about project concepts or details of the proposals they made and only provided limited response to our written questions. Our field inspections were limited to an informal visit to the Astana passenger station and associated freight marshaling yard conducted on our own initiative. US firms operating in the railway sector in Kazakhstan also showed limited interest in this Definitional Mission and in discussions were very open concerning a variety of factors that make doing profitable business in Kazakhstan and with KTZ as quite challenging. Our general assessment is that this sector DM was somewhat premature and success would have been greater if the DM was held perhaps following the planned OV rather than prior to it.

Row Labels	Sum of Total 2010 - 20	Sum of %
Rolling Stock	$ 11,388,628,930	49.7%
Infrastructure	$ 7,141,729,449	31.2%
Miscellaneous	$ 4,364,040,877	19.1%
Grand Total	**$ 22,894,399,256**	**100.0%**

Figure 1: Broad Categories of KTZ 2010-20 Capital Investment Plan

The projects developed during these meetings and proposed for USTDA consideration are:

1. Corridor **Feasibility Study** for Implementation of a New Signaling System

2. **Technical Assistance** for Railway Passenger Service Master Planning

Kazakhstan Map (Source: United Nations)

EXECUTIVE SUMMARY: CORRIDOR FEASIBILITY STUDY FOR IMPLEMENTATION OF A NEW SIGNALING SYSTEM

The priority project requested by KTZ is a feasibility study for new signaling and control systems on three main corridor segments. To provide context for the project description the following section provides general background on the history and functions of railway traffic control systems.

About Railway Traffic Control Systems

Trains are restricted to moving back and forth on the guideway provided by the rails. If vehicles are not kept in proper relation to one another on the tracks they will collide. In the 19th century train speeds reached the point where stopping distance exceeded sightlines necessitating development of operational practices and physical infrastructure to control and manage traffic. These systems continue to evolve to this day with a mix of old and new applied in various combinations across many systems depending on the characteristics of the traffic and routes. Traffic control and signaling systems support safety of train operations, serve to manage the traffic capacity of the infrastructure and increasingly serve to aid in management of the health and condition of rolling stock and infrastructure.

The first means of railway traffic control was **timetabling**, whereby traffic was managed by strict establishment of meeting points where paths were available for trains to be routed past one another, such as by sidings or at stations. The core principle of this system is maintaining physical separation through temporal spacing of trains. Detailed **operating rules** governed the behavior of trains at meeting points whereby one train has priority over the other based upon a classification system. These rules were designed as much as possible to be **fail-safe**. The advent of the telegraph enabled enhancement of timetabling with **train orders** issued by dispatchers to enable traffic management by giving train operators direct instructions to make deviations from the timetable.

Block signaling systems function by dividing track into defined sections which can only be occupied by one train at a time. Typically block spacing was determined by the theoretical train with the worst performance characteristics that would occupy the block (greatest train length, longest stopping distance plus a margin of safety). As most networks have a diverse range of train performance this inevitably creates some inefficiencies and reduces capacity as blocks must be established very conservatively and most traffic does not require such large blocks. The first signaling systems were **manual block** whereby access to each block was directly controlled by an operator. **Automatic block signaling** (ABS) was introduced in the late 19th century whereby mechanical or electronic circuits are embedded in the track that detect the presence of a train. Instructions are provided to train operators through trackside visual signals which are activated by physical connections or electronic signals. The visual signals provide instructions based on the operating rules, instructing trains to stop or proceed at certain speeds based on the occupancy of nearby blocks by other trains. Mechanical automatic block systems were rapidly replaced by

electric automatic block systems throughout the 20th century, though many railways still have some examples of mechanical ABS in operation, notably for **interlockings**, particularly at lower density junctions and terminals. (Interlockings are arrangements where multiple tracks connect and fail safe devices are built into the track structure to enable establishment of physical paths across these junctions so that trains do not have switches thrown beneath them and that prevent train paths from crossing.) **Cab signaling** was developed in the early 20th century whereby signals are transmitted from the infrastructure directly to a receiver in the locomotive cab providing the signal aspect on a display visible to the driver. By enabling a direct display in the driver's cab errors in reading wayside signals were reduced. Cab signaling has evolved to **automatic train stop (ATS)** systems where trains have on-board rule based systems that detect when the operator is in violation of operating rules based on information provided by the cab signaling system and the system takes direct control of the train and forces a stop if an unsafe movement is detected. This system continues to evolve with variations of **automatic train control (ATC)** whereby the system will automatically manage adjustments in acceleration and braking of the train. Signaling systems also control **at-grade crossings**, where the railway network interfaces with automobile traffic. Approaching trains trigger mechanical or electronic circuits, activating devices which warn automobiles of train traffic and may physically prevent them from attempting to cross the rail right-of-way.

Centralized traffic control (CTC) refers to any system where a dispatcher controls the clearing of signals for train operation and the throwing of switches changing paths. These control centers can range from very small facilities with a single operator, such as for interlocking at a small terminal or yard, ranging up to massive facilities controlling thousands of miles of network with many dispatchers. **Computer aided-dispatching** adds modeling and forecasting capability to CTC and enables adaptive management of traffic flow. Even on relatively simple railroads the variables of train types, performance and network structure can result in extremely complex calculations being necessary to optimize traffic and best meet the operating goals of the system. Modern CAD systems in certain cases have direct control over infrastructure.

The domain of railway traffic control also includes a variety of other devices that are increasingly networked into CTC/CAD, MIS and maintenance systems at railroads. These include **defect detection equipment** that monitors trains and infrastructure through sensors for malfunctions and transmits warnings and condition data to the appropriate operating personnel. **Automatic equipment identification (AEI)** tags mark railway cars and locomotives and are used to support the function of tracking and moving cargoes to their destination efficiently. While not directly connected to traffic control, on the commercial/logistics side, massive **databases** have been developed for managing the flow of goods between different railways from origin to destination and for managing the allocation of costs for use of infrastructure between rail operators and for carriage of wagons originating with another railroad.

Advanced Train Control Systems (ATCS) refers to a wide variety of technologies, various aspects of which are in development, pilot stage as well as full operation, that take advantage of

increases in computer system processing power, software systems, reduced hardware form factors and cost and new – generally wireless – communications and geospatial technologies. This broad range of systems and technologies incorporates **positive train control (PTC)** and **communications based train control (CBTC)**. These systems utilize train based sensors (such as GPS, accelerometers) cross referencing a software based infrastructure database to determine train location with extreme precision and without referencing wayside signal systems. Wireless communications between trains support positive train separation and communications with a central office server enables network wide traffic management with a high degree of automation. With PTC the possibility for flexible block operations exists, whereby virtual blocks are established around each train based on their precise operating characteristics. Full implementation of this capability is still in pilot testing, but should enable railways to achieve near perfect capacity utilization as all track space will be optimally allocated. In full implementation these systems should also permit elimination of significant components of the traditional lineside signaling systems which are extremely expensive to maintain. The US government has established a PTC mandate requiring aspects of these technologies to be implemented on lines meeting certain traffic conditions and US railways have embarked on capital programs expected to total in the tens of billions over the next several years by the time the effort is completed. **Electronic track warrant systems** are a subset of these technologies whereby track warrants (dispatch documents authorizing entry of a train into a certain section of infrastructure under certain restrictions) are issued wirelessly and tracked centrally with a high degree of automation; these are considered a promising technology for implementation in the many parts of railroad networks (particularly low density lines) that are often still **dark territory**, that is not signalized and still operated under variants of timetable/train order systems. A number of these systems are in operation today with others in pilot or development phase.

PROJECT DESCRIPTION

Kazakhstan Temir Zholy "Kazakhstan Railways" is engaged in an aggressive plan of railway development. A primary objective of this plan is to improve capacity on major corridors throughout the country, in particular to support domestic export and transit freight traffic growth taking advantage of KTZ's strategic "crossroads" position in Central Asia. In parallel, significant investment is underway and planned to improve and increase railway passenger service as demand for service presently outstrips supply and service quality requires improvement. KTZ anticipates most major lines in the country will continue to carry mixed passenger and freight traffic and they intend to bring peak speeds on main corridors from a present 140 kilometers per hour on main lines up to 160 and ultimately to 200 kilometers per hour. From a control, safety and capacity perspective these goals will be a technical challenge to achieve.

Presently the major railway corridors in Kazakhstan are controlled using legacy Soviet Union-era electric automated block signal systems. These systems are outdated, costly to maintain and KTZ has assessed that they will be inefficient to support the capacity needs in accordance with

projected future traffic levels and characteristics. Presently KTZ is preparing system pilot projects with two vendors to evaluate certain specific offerings for signal system enhancements. Ansaldo STS is undertaking a limited pilot of some components of a European Train Control System (ETCS) on a branch line east of Almaty. KTZ is also developing a limited pilot of GE transportation's Incremental Train Control System (ITCS) on the approximately 300 route-kilometer low-density line segment Moyynty – Sayaq that is expected to begin this year.

KTZ has requested a USTDA grant-financed feasibility study of signaling system enhancement examining three railway corridor segments (the "corridors") that they consider representative of the national network. These corridors are:

1) Shymkent – Qazaly
a) Route Kilometers: 792
b) No. of Switches : 990 power thrown switches (interlocked switch)
c) No. of Freight Trains Per Day: 12 pairs (24) per day
d) No. of Passenger Trains Per Day: 10 pairs (20) per day
e) Current Signaling & Communications System: *Electric interlocking* – relay interlocking;
Automatic block signal system: segment Shymkent-Arys – numerical coded circuit blocking;
Segment Arys-Qazaly – pulse-wire block system;
Centralized dispatching control: segments Shymkent-Arys, Bakhtysai-Berkhazan – centralized control (frequency centralized control);
Segments Akkum-Akmaya, Tyuratam-Qazaly – polar-frequency control;
Segments Turkestan-Talap, Belkol-Dirmen-tobe – absent;
Segment Akdala-Turkestan – Neva frequency centralized dispatching control.
f) Dispatch Region: dispatch center – segment Shymkent-Turkestan – Shymkent station; segment Turkestan-Qazaly – Qyzylorda station

2) Qazaly - Qandyaghash
a) Route Kilometers: 615.8
b) No. of Switches: 854 power thrown switches (interlocked switch)
c) No. of Freight Trains Per Day: 12 pairs (24) per day
d) No. of Passenger Trains Per Day: 10 pairs (20) per day
e) Current Signaling & Communications System: *Electric interlocking* – relay interlocking;
Automatic block signal system – pulse-wire block system;
Centralized dispatching control: segment Saksaulskaya-Qandyaghash – Neva frequency centralized dispatching control;
Segment Qazaly-Saksaulskaya – Luch frequency centralized dispatching control;
f) Dispatch Region: dispatch center – segment Qandyaghash- Saksaulskaya – Aktobe station; segment Saksaulskaya- Qazaly – Qyzylorda station

3)Almaty - Aqtoghay
a) Route Kilometers: 471.9
b) No. of Switches: 731 power thrown switches (interlocked switch)
c) No. of Freight Trains Per Day: 10 pairs (20) per day
d) No. of Passenger Trains Per Day: 8 pairs (16) per day
e) Current Signaling & Communications System: *Electric interlocking* – relay interlocking;

Automatic block signal system – pulse-wire block system;
Centralized dispatching control – polar-frequency control;

f) Dispatch Region: dispatch center – Almaty station

The objective of this feasibility study is to provide KTZ with technical and economic information to support their decision to make capital investments on selected study corridors or system-wide in a new signaling system or systems ("implementation"). The system(s) should support achievement of KTZ's service goals safely, efficiently and at the best lifecycle cost.

The envisioned timeframe for this study and subsequent Implementation is as follows:

TIME →

Phase 1: USTDA	Phase 2: KTZ/Government of Kazakhstan
Feasibility Study	Implementation
2011	2012 - 2020

PROJECT SPONSOR CAPABILITIES AND COMMITMENT

The government of Kazakhstan has successfully partnered with a number of multilateral agencies on development projects including the World Bank, Asian Development Bank, Islamic Development Bank, JBIC and European Bank for Reconstruction and Development. As discussed in more detail later, Kazakhstan is aggressively pursuing partnerships with a variety of foreign firms and KTZ is doing so in the rail sector.

Our impression of the KTZ management was that they were interested in taking advantage of USTDA funds to perform the studies. They appear to have a strong pool of technically competent and proficient managers and staff. They are also investing heavily in their management infrastructure. We did however receive the impression that while they welcomed the opportunity to host USTDA grant-financed activities it was a relatively low priority in their scheme of things. We anticipate that the Contractor ultimately selected to execute the Feasibility Study will face significant schedule risk as resources and information may not be provided in a timely manner and reviews and decisions on deliverables and recommendations may be substantially delayed. This could be extremely problematic because extending stays of well compensated personnel in Kazakhstan at high per diem rates to accommodate KTZ's pace of operations and decision-making may not be possible for most US firms. A Study Contractor without ongoing operations and permanent resources stationed in Kazakhstan may have difficulty accomplishing the scope of work within the schedule and budget proposed.

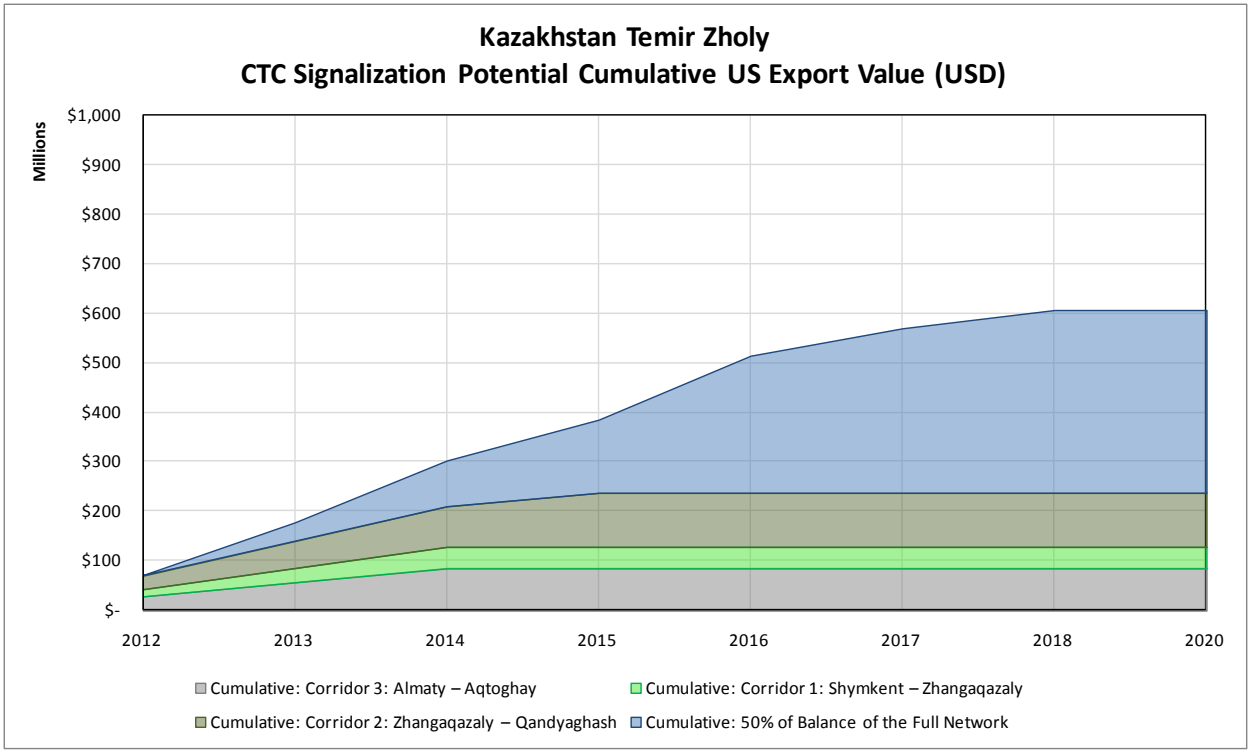
IMPLEMENTATION FINANCING

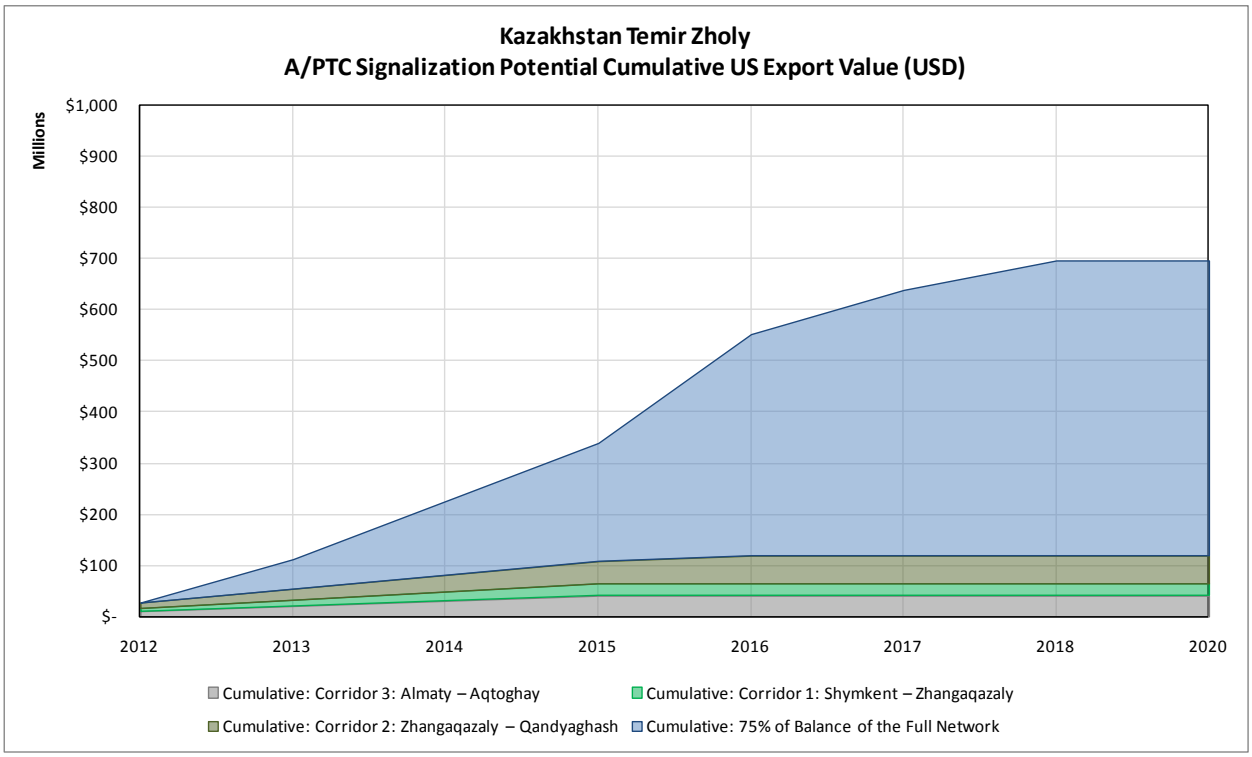
Kazakhstan is in an advantageous position relative to many other developing/middle income countries in that they have a tremendous base of resources generating income, albeit heavily dependent upon petroleum export revenues. They have also demonstrated an ability to generally

channel those resources in the directions set by national policy. Relatively successful development of the Tengiz petroleum deposits and the new capital sector of Astana – major complex public works projects – (among others) are indicative of this level of relative control which is occasionally lacking in other commodity based developing economies. Therefore they appear to be in the position of being able to self-finance major economic development projects. Railway sector development figures prominently in the government's economic diversification efforts initiated following the global economic crisis and it is likely that the sector will receive significant resources in the next years. The Consultant anticipates that expenditures in excess of $1 billion between now and 2020 are likely to be wholly funded from internal national resources, with external financing used on a relatively limited basis. The financial projections published by KTZ are at best unclear. KTZ is presently undergoing a primary restructuring that is rearranging every aspect of the enterprise. They forecast significant "profits" for the enterprise going forward during the capital forecast period, rising from an approximate break-even now with some unclear level of subsidy. Without an in depth analysis of the enterprise's financial management, reporting and planning it cannot be determined if the capital investment forecast can be fully financed internally. We believe it is prudent to assume that to achieve their aggressive capital investment objectives KTZ will require significant subsidy to be drawn from higher levels of the Kazakhstan government. Any significant drop in prices for key export commodities will likely be reflected to some degree with proportional reductions of KTZ's capital activities.

U.S. EXPORT POTENTIAL

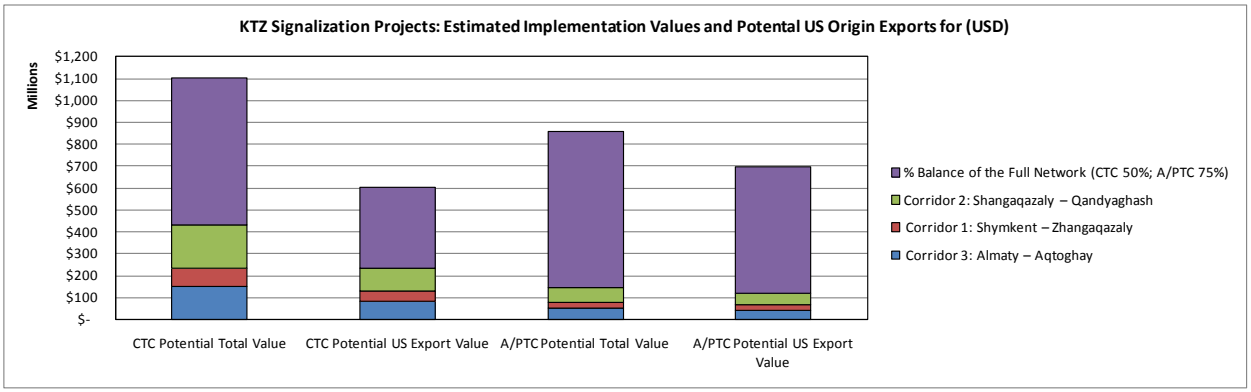
To develop an export forecast we began with per unit costs for CTC implementation in the United States, which range from under $200,000 to over $1,000,000 per route mile. The wide variation is because different levels and types of traffic drive the density of infrastructure components per unit of track as well as the selection of more advanced or additional components to the signaling systems. The range of unit costs was allocated on a percentage basis to the study corridors based on a best estimation of higher traffic density driving higher unit values, with greater cost expected in the regions approaching major nodes. The unit costs were also adjusted with assumptions made on the split of goods and services between local/regional sourcing and US origin. A/PTC unit costs were developed assuming some reductions in overall wayside infrastructure components but higher prices for the remaining onboard and wayside components. It was anticipated that US origin goods and services would compose a higher percentage in an A/PTC implementation than with CTC due to the more advanced nature of many components.





We estimate that this proposed Feasibility Study could lead to US origin exports of goods and services ranging between $31 million up to $236 million US dollars that would be purchased in the period 2012 – 2020. These calculations are assuming Implementation on between one and three of just the corridors being studied. With a study budget of $655,188 this generates in the

weakest case a multiplier of 48 for a USTDA grant to US-origin exports ratio. We also evaluated potential for Implementation being extended beyond the study corridors onto a percentage of the rest of KTZ's network. Such a large scale network-wide Implementation could possibly generate as much as between $605 and $697 million in US origin goods and services in the most optimistic scenario.



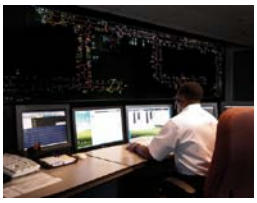
KTZ officials indicated that all procurements that may result from the grant-financed project should be subject to competitive tenders in which international suppliers can participate providing equal access to US firms. The equipment and services that are likely to be exported from the US for an Implementation include but are not limited to:

- **Goods:** Cables; wires; fasteners; plastic and metal equipment and electronics housings; flat panel displays; micro-electronic chips; circuits; electromechanical sensors; networked computer systems; electric motors; railway track components particularly related to switches and junctions; transmission/receiving equipment and other electronic devices.

- **Services:** Software engineering services; network engineering services; telecommunications engineering services; business and economic analysis services; project management services; railway infrastructure engineering services; railway signaling and communications engineering services; rail vehicle mechanical and controls engineering services; documentation preparation services and technical writing, and; training and education;

- **Technologies:** Intellectual property in the form of software and service licenses, training and certification.

Railway traffic control systems, while exhibiting certain core capabilities, are custom products. The goods services and technologies may vary significantly depending upon the specifications, performance requirements and the characteristics of the railway operation – size of the railway infrastructure and telecommunications system(s) networks, the rolling stock fleet size and characteristics and the frequency, density and characteristics of operations. Below are illustrated a few examples of the types of physical components provided by US vendors that can make up a railway traffic control system.



(Left to Right): Stratus Technologies high-availability server used as a component of the Lockheed Martin PTC system; Wabtec Railway Electronics Trainlink II End-of-Train Telemetry System; GE Transportation's CTS-2 Point Machine; MeteorComm MCC-545C Packet Data Radio (Communications Segment); a view of GE RailEdge traffic control software installed in a railway dispatch center.

Presently the following US firms (or firms with a significant US manufacturing base) are identified as providers of traffic control systems and key component technologies:

- General Electric Transportation;
- Ansaldo STS (purchased Union Switch & Signal, a major US communication & signaling firm);
- Wabtec Railway Electronics;
- Invensys (purchased Safetran Systems a major US communication & signaling firm);
- Lockheed Martin Corporation;
- Meteor Communications Corp.;
- Railcomm.

From an export generation perspective consolidation and acquisitions in this sector present a challenge as some of the major signaling equipment firms in the US have been purchased in

recent years by foreign companies. These firms have production facilities located in Eurasia, notably Ansaldo and Invensys. As they are under foreign ownership it is unclear where they would ultimately source labor and equipment from if involved in an implementation in Kazakhstan. General Electric, while US controlled, has invested aggressively in past years in developing its skilled foreign labor forces and in advanced manufacturing facilities in locations with substantially lower costs that are closer to their overseas markets. The Contractor has had substantive discussions with GE, Wabtec and Lockheed Martin who have all expressed interest in potentially participating in a USTDA grant-financed project and an implementation. General Electric and Wabtec are presently partnered in aspects of the Kazakhstan locomotive manufacturing joint venture and they are highly likely to be the primary US beneficiaries of a USTDA study.

FOREIGN COMPETITION AND MARKET ENTRY ISSUES

The Kazakhstan railway market is open to US companies but is highly competitive. General Electric Transportation is the most visible US supplier in the railway sector. Kazakhstan appears to be aggressively courting a wide range of major railway suppliers from the US, Europe and Russia. This may be serving various goals, including an effort to balance ties among economic and political stakeholders in neighboring regions that Kazakhstan sees as critical to its future independence and prosperity. Specifically they are reaching out to the primary regions where it can be anticipated to develop markets for reciprocal rail transport services and where they see the bulk of rail freight flows ultimately originating or terminating. This supply base diversification will also prevent Kazakhstan from becoming wholly dependent upon a vendor base for rail operations that is under common political control. Given these consideration it is probable that KTZ might select a mix of vendors to satisfy its needs in the signaling and communications sector, even if this results in a more expensive or less efficient solution than if they were to pursue a single solution or standard from a lone vendor or consortium. This will reduce the potential sales of US exporters. It should be noted that most European and US railway entities aggressively pursue vendor diversification in the signaling and communications sector in order to avoid becoming captive buyers.

It is also likely that interoperability across transnational corridors may have a significant impact on vendor and system choices. Lines heading east to China, north to Russia, west toward Europe and south towards India and Iran all present unique interoperability considerations ranging from traction power, track and loading gauge, train lengths and weights and traffic control and customs procedures. Technology and vendor choices may very well be made in the context of transnational dialogues and multi-decade estimates of traffic flow volumes and types. KTZ sees a significant aspect of its future development lying outside its borders – either by attracting external transit traffic to pass through Kazakhstan or by extending operations outside its borders. In this sense the enterprise resembles Germany’s Deutsche Bahn in terms of strategic development philosophy.

KTZ presently utilizes Soviet-era signaling and communications technology across its network that is old and inefficient. KTZ's significant capital investment budget, with nearly $1b USD for signaling and communications, demonstrates their clear interest in replacing large portions of this infrastructure. From the perspective of a supplier this market is presently open for a wide range of modern signaling and communications solutions.

Procurement is reportedly challenging. KTZ, although centralized, is a highly bureaucratic organization. It is also extremely overstaffed given current levels of production, indicating a high degree of inefficiency is built into day to day operations at all levels. Procurement decisions and relationships with vendors may be strongly influenced by individual personalities within the system. Kazakhstan is also a centralized state and KTZ's position as a strategic enterprise reportedly makes collection and analysis of data extremely challenging at times. Data that is open source in many other parts of the world and that vendors are used to easily accessing to support market development may be considered a state secret in Kazakhstan. Any railway supply company attempting to do business in Kazakhstan will likely find it necessary to invest in a permanent presence on the ground in order to successfully develop the market for their goods. They must also have adequate resources for a long-term commitment necessary to achieve market entry and sustainment.

DEVELOPMENTAL IMPACT

Primary Developmental Benefits

Infrastructure: Signalization and traffic control enables more intensive and efficient use of railway infrastructure. This maximizes the effectiveness of funds spent to build and maintain rail infrastructure and rolling stock. Diversion of freight and passenger traffic from the less efficient roads sector enables the country to reduce its proportionally higher per traffic unit costs for maintenance and construction. Improved signaling and traffic control reduces congestion on railways by enabling reduced headways between trains at the same or increased speeds. Improved awareness and control of traffic enables network managers to adapt traffic more effectively on a dynamic basis, reducing delays due to unexpected conditions. These improvements can be a significant component in disciplined operations necessary to attract high value merchandise to railways, such as containerized and perishable goods. The benefits of signalization ripple through the national transport system and supply and business networks.

Human Capacity Building: As a complex information system, a modern signaling and traffic control system installation or enhancement will necessitate significant investment in railway employees and managers to enable the organization to use the new technology effectively and safely. Education and training required will be focused in the areas of electronics, software and systems. Personnel will be required to learn new maintenance and operating practices and managers will need to adapt to the new levels of control and visibility they will have to support decision making.

Technology Transfer: Signalization projects generally require a significant presence of outside contractors and advisors during construction and initial operation. However KTZ can be expected to quickly develop a strong internal capacity over time to maintain and manage the new system or enhancements. Given the country's interest in industrial development in the transport manufacturing sector and in the high technology components sector it would not be unreasonable to expect that they would seek to produce some components of signaling systems themselves for domestic or regional consumption over time. KTZ is likely to also develop a strong internal capability for programming and customization of whatever systems they acquire; anecdotal reports indicate a strong tendency for customizing solutions in house.

Productivity Improvements: A new or enhanced signaling/traffic control system is expected to generate significant productivity improvements. The likely modal diversion that results from improvements to railway operations will reduce the manpower per traffic unit moved throughout multimodal transport network overall, though at the railways themselves generally employment may increase in some segments and require more educated workers due to realization of the implementation benefits. Within the railway system itself a reduction in low skilled jobs associated with manual traffic control or legacy systems will occur. At the operations level fewer personnel will be required to manage dispatch and traffic control functions for the same number of trains over given areas of the network; the remaining personnel will require higher levels of training and education than their predecessors. Positions for train operators and mechanical personnel should increase as intensity of operations is expected to increase with the new systems, more trains will operate over the system. Track maintenance personnel should increase as more traffic units and more intensive use of infrastructure will result in more wear and tear. Signaling maintenance personnel may increase depending on the technologies being replaced and they will likely need higher levels of education and training than their predecessors. If an aggressive use of wireless systems is selected this may result in a significant decrease in signal maintenance activity as wayside infrastructure – particularly physical connections and wires for power transmission and communication – may be substantially reduced.

Market-Oriented Reforms: Kazakhstan is heavily dependent on exports of commodities which require effective bulk transport systems, notably fossil fuels and ores. It is critical to them to have a reliable high capacity rail transport capability to move these heavy and relatively low value goods to external markets. An efficient and effective freight rail capability maximizes the profitability of this industry and enables the most effective competition in the global markets.

Kazakhstan was deeply impacted by the recent drops in prices in their core export markets for these goods. While minerals and metals are likely to remain the core of their economy they have embarked on a dedicated effort to attempt to diversify production to protect themselves to a degree from future volatility. Correspondingly they are seeking to develop domestic industries and export markets for manufactured and high value added goods, notably through the recently launched "State Program for Industrial-Innovative Development." This ambitious program seeks to:

1. Grow GDP by 50% from 2008;
2. Increase manufacturing labor productivity by 50% and in other sectors by 100%;
3. Increase proportion of non-oil and gas exports by 40%;
4. Reduce energy intensity of GDP no less than 10% from 2008;
5. Increase number of enterprises by 10%.

The core industrial areas to be developed are:

- Metallurgy and manufacture of metal products
- Oil refining and oil and gas infrastructure
- Chemical and pharmaceutical industry
- Agro-industrial complex
- Defense industry
- Construction industry and production of construction materials
- Transport and info-communications
- Engineering industry
- Uranium industry
- Light industry
- Tourism
- Space activity

To do this Kazakhstan must be able to provide world class inbound and outbound logistics networks in order to compete internationally and rail is a key component of cost effective transport service for many of the industries identified. If Kazakhstan's rail network is inefficient, this will result high relative logistics costs, delays and uncertainty for shippers. This will likely cause the government to engage in disproportionate subsidization and interference in the market mechanisms as they seek to develop the sectors and create independent businesses while trying to deal with a significant cost that is higher than in competing nations with more efficient railways.

A major part of this initiative is an effort by Kazakhstan authorities to open their market to partnerships and joint ventures with foreign firms, including US firms. Any US firm evaluating a significant investment where rail is a key component of their logistics will examine the functioning of the rail system carefully. Implementation of new signaling and traffic control systems on the railway will result in quantifiable benefits in terms of tariffs, transport times and reliability that will factor positively into their due diligence.

Finally, Kazakhstan is a partner with NATO and the US in the Northern Distribution Network, developed to provide an alternative pathway to Pakistan for non-lethal supplies to multinational forces and the new government in Afghanistan. KTZ's network is a crucial segment of this network. A key benefit and incentive to Kazakhstan's participation in this logistics network is the opportunity to develop local industries to satisfy demand for the wide range of goods moving over this network, reducing end user costs by sourcing closer to the destination. Any improvement to KTZ's operations, such as would occur through implementation, will support their efforts to develop globally competitive local industries to feed this supply chain, as well as reducing throughput and reliability for the end users of the network regardless of the origin of the goods.

Alternatives

The alternative to achieve some key benefits, particularly capacity increases, provided by a new or enhanced signaling/traffic control system is to embark on some fundamental change to the infrastructure, rolling stock or operations. This can include:

1. Build significant amounts of new track. Capacity improvements through track construction can include building sidings and spurs to enable passing and storage of trains and wagons, adding connections and junctions between existing lines, adding additional tracks to existing routes or building completely new rail lines. These options are all expensive, particularly in developed areas or in difficult terrain;

2. Increase track speeds. This implies significant investment in basic track components such as ties, rail and fasteners. It can also require significant adjustments in track alignment, notably degree and angle of curves;

3. Increase per axle loadings. This implies major investments in rolling stock for larger wagons and more powerful locomotives to pull them. Major investments in terminal infrastructure and in network track and structure are necessary to accommodate;

4. Increase trailing tonnage and/or train length. This requires major investments in rolling stock, such as for new railcars and coupler systems, and more/more powerful locomotives. Major track and structure investments are also required in areas such as overall lengthening of infrastructure features such as passing sidings and classification yard and terminal tracks;

5. Increase loading gauge. The loading gauge is the envelope of space which rolling stock, must fit through during movement along the rail. Increasing the loading gauge enables higher/wider cars to be transported. This will typically require major investments in infrastructure modifications for removing gauge obstacles such as by increasing bridge and tunnel clearances. New rolling stock typically must be purchased to take advantage of these improvements;

6. Make fundamental operations changes. An example of this is the US freight railroad shift to scheduled operations in recent years.

It should be noted that investments in the traffic control and communication systems often play a key role in enabling and supporting these other capacity investments. Several of these options so fundamentally change train performance characteristics that changes in signal block spacing are necessary to enable realization of the capacity benefit.

All of these can be effective to some degree and often very much so in localized cases, particularly the first option of building additional track. However in most situations they are generally not a cost effective solution for any significant corridor or portion of a network unless the infrastructure is truly at full capacity with modern field proven control technologies and operating practices in place and there is significant potential for additional traffic. To choose these types of strategic investments typically requires significant unmet demand for railway transport to exist (or be reasonably developable) to enable the recovery of the capital costs from the revenue to be generated from additional traffic over a viable timeframe. Railways are generally constantly evaluating mixes of the investments described across their networks; enhancements to signaling and control systems will generally help achieve some or all desired benefits over a given timeframe while postponing or avoiding entirely the more costly options.

IMPACT ON THE ENVIRONMENT

Railway traffic control systems have as a fundamental objective the increase in efficient utilization of the available track space to move trains, moving them closer together, at higher speeds, while reducing delays, thereby increasing network capacity and quality of service. This creates the fundamental driver of environmental benefits which is some degree of modal

shift whereby railways capture an increasing share of freight and passenger traffic that would otherwise travel by roads. The most notable environmental benefit is reductions in fuel use and emitted pollutants as trains can move significantly more passengers and tons of freight per unit of distance for the same amount of transport fuel being burned (2-4 times less fuel and 2-3 times less emissions per freight ton-mile moved [Source: BNSF Railway]).

In the case where portions of the railways are electrified, as in Kazakhstan, some components of the traction power can be provided potentially from renewable or low carbon sources such as wind, solar, hydroelectric and nuclear. Kazakhstan presently generates 12% of its electricity from hydropower and there is significant potential for additional hydroelectric development, as well as wind and solar energy development. While not presently operating nuclear plants, Kazakhstan is one of the world's largest producers of uranium and nuclear options for electricity generation are under exploration, notably a 600 megawatt plant of Russian design to be built near Aktau that is under feasibility study and could be the first to start construction. France, for example, has electrified nearly half of its railway network and more than 75% of French electricity generated comes from nuclear power with another 12% generated by hydropower. While Kazakhstan has extraordinary fossil fuel resources, the best use of these is often for export. Development of alternative electricity resources can increase the profit per unit of fossil fuel exports when the power used for processing and transport of exported fossil fuels includes sources other than the export itself. Therefore the fossil fuel wealth of Kazakhstan does not necessarily preclude the national strategy of diversifying its system to include a greater share of "greener" options to support electricity generation which will be used for traction power. Kazakhstan's goal of full integration into the regional rail network will also drive increased electrification of major rail corridors, increasing demand for electricity for traction power.

Modal diversion to rail will correspondingly reduce the need for road capacity expansion as well as decreasing road maintenance activities that would have otherwise been needed, all of which create their own negative impacts on the natural and human environments. Asphalt, a frequent bulk component of road infrastructure is partially a petroleum product, and the mining, processing and transport of the large amounts of aggregates used for road construction (and maintenance) generate their own negative environmental externalities. Road infrastructure is more space intensive per traffic unit than railway infrastructure and construction correspondingly results in proportionally greater disturbances of adjacent human and natural environments. Dense road infrastructure is also a contributor to the heat island effect, driving up use of energy for cooling in urban areas (where the effect isn't overtaken or netted out due to seasonal variations in temperature).

Negative environmental impacts of signaling system implementations are limited. There will be some aspects of electromagnetic energy emissions impacts, mostly affecting certain categories of railway employees, depending on the degree and types of wireless technologies used on the system. Increased utilization of the rail system driven by enhanced signaling will result in some infrastructure expansion, particularly at terminals, junctions and nodes, and

increased traffic will lead to more conflicts with at-grade road crossings in certain areas, causing localized automobile traffic delays or necessitating infrastructure projects to segregate the different modes. The positive environmental impacts of signalization or signaling enhancement, when monetized, can be expected to significantly outweigh negative impacts.

IMPACT ON U.S. LABOR

Neither the proposed Technical Assistance project nor an Implementation are expected to:

a. Incentivize any company currently located in the US to relocate outside of the US or to incentivize any such firm to reduce employment because US production is being replaced by production outside the US.

b. Violate internationally recognized workers rights.

c. Directly assist establishing or expanding production of any commodity for export by any country other than the United States, if the commodity is likely to be in surplus on world markets at the time the resulting productive capacity is expected to become operative and if the assistance will cause substantial injury to United States producers of the same, similar, or competing commodity.

A N N E X 3

U.S. TRADE AND DEVELOPMENT AGENCY
Arlington, VA 22209-2131

NATIONALITY, SOURCE, AND ORIGIN REQUIREMENTS

The purpose of USTDA's nationality, source, and origin requirements is to assure the maximum practicable participation of American contractors, technology, equipment and materials in the prefeasibility, feasibility, and implementation stages of a project.

USTDA STANDARD RULE (GRANT AGREEMENT STANDARD LANGUAGE):

Except as USTDA may otherwise agree, each of the following provisions shall apply to the delivery of goods and services funded by USTDA under this Grant Agreement: (a) for professional services, the Contractor must be either a U.S. firm or U.S. individual; (b) the Contractor may use U.S. subcontractors without limitation, but the use of subcontractors from host country may not exceed twenty percent (20%) of the USTDA Grant amount and may only be used for specific services from the Terms of Reference identified in the subcontract; (c) employees of U.S. Contractor or U.S. subcontractor firms responsible for professional services shall be U.S. citizens or non-U.S. citizens lawfully admitted for permanent residence in the U.S.; (d) goods purchased for implementation of the Study and associated delivery services (e.g., international transportation and insurance) must have their nationality, source and origin in the United States; and (e) goods and services incidental to Study support (e.g., local lodging, food, and transportation) in host country are not subject to the above restrictions. USTDA will make available further details concerning these standards of eligibility upon request.

NATIONALITY:

1) Rule

Except as USTDA may otherwise agree, the Contractor for USTDA funded activities must be either a U.S. firm or a U.S. individual. Prime contractors may utilize U.S.

subcontractors without limitation, but the use of host country subcontractors is limited to 20% of the USTDA grant amount.

2) Application

Accordingly, only a U.S. firm or U.S. individual may submit proposals on USTDA funded activities. Although those proposals may include subcontracting arrangements with host country firms or individuals for up to 20% of the USTDA grant amount, they may not include subcontracts with third country entities. U.S. firms submitting proposals must ensure that the professional services funded by the USTDA grant, to the extent not subcontracted to host country entities, are supplied by employees of the firm or employees of U.S. subcontractor firms who are U.S. individuals.

Interested U.S. firms and consultants who submit proposals must meet USTDA nationality requirements as of the due date for the submission of proposals and, if selected, must continue to meet such requirements throughout the duration of the USTDA-financed activity. These nationality provisions apply to whatever portion of the Terms of Reference is funded with the USTDA grant.

3) Definitions

A "U.S. individual" is (a) a U.S. citizen, or (b) a non-U.S. citizen lawfully admitted for permanent residence in the U.S. (a green card holder).

A "U.S. firm" is a privately owned firm which is incorporated in the U.S., with its principal place of business in the U.S., and which is either (a) more than 50% owned by U.S. individuals, or (b) has been incorporated in the U.S. for more than three (3) years prior to the issuance date of the request for proposals; has performed similar services in the U.S. for that three (3) year period; employs U.S. citizens in more than half of its permanent full-time positions in the U.S.; and has the existing capability in the U.S. to perform the work in question.

A partnership, organized in the U.S. with its principal place of business in the U.S., may also qualify as a “U.S. firm” as would a joint venture organized or incorporated in the United States consisting entirely of U.S. firms and/or U.S. individuals.

A nonprofit organization, such as an educational institution, foundation, or association may also qualify as a “U.S. firm” if it is incorporated in the United States and managed by a governing body, a majority of whose members are U.S. individuals.

SOURCE AND ORIGIN:

1) Rule

In addition to the nationality requirement stated above, any goods (e.g., equipment and materials) and services related to their shipment (e.g., international transportation and insurance) funded under the USTDA Grant Agreement must have their source and origin in the United States, unless USTDA otherwise agrees. However, necessary purchases of goods and project support services which are unavailable from a U.S. source (e.g., local food, housing and transportation) are eligible without specific USTDA approval.

2) Application

Accordingly, the prime contractor must be able to demonstrate that all goods and services purchased in the host country to carry out the Terms of Reference for a USTDA Grant Agreement that were not of U.S. source and origin were unavailable in the United States.

3) Definitions

“Source” means the country from which shipment is made.

"Origin” means the place of production, through manufacturing, assembly or otherwise.

Questions regarding these nationality, source and origin requirements may be addressed to the USTDA Office of General Counsel.

ANNEX 4

GRANT AGREEMENT

This Grant Agreement is entered into between the Government of the United States of America, acting through the U.S. Trade and Development Agency ("USTDA") and Kazakhstan Temir Zholy ("Grantee"). USTDA agrees to provide the Grantee under the terms of this Agreement US$655,188 ("USTDA Grant") to fund the cost of goods and services required for a feasibility study ("Study") on the proposed Rail Signaling and Train Control Systems project ("Project") in Kazakhstan ("Host Country").

1. USTDA Funding

The funding to be provided under this Grant Agreement shall be used to fund the costs of a contract between the Grantee and the U.S. firm selected by the Grantee ("Contractor") under which the Contractor will perform the Study ("Contract"). Payment to the Contractor will be made directly by USTDA on behalf of the Grantee with the USTDA Grant funds provided under this Grant Agreement.

2. Terms of Reference

The Terms of Reference for the Study ("Terms of Reference") are attached as Annex I and are hereby made a part of this Grant Agreement. The Study will examine the technical, financial, environmental, and other critical aspects of the proposed Project. The Terms of Reference for the Study shall also be included in the Contract.

3. Standards of Conduct

USTDA and the Grantee recognize the existence of standards of conduct for public officials, and commercial entities, in their respective countries. The parties to this Grant Agreement and the Contractor shall observe these standards, which include not accepting payment of money or anything of value, directly or indirectly, from any person for the purpose of illegally or improperly inducing anyone to take any action favorable to any party in connection with the Study.

4. Grantee Responsibilities

The Grantee shall undertake its best efforts to provide reasonable support for the Contractor, such as local transportation, office space, and secretarial support.

5. USTDA as Financier

(A) USTDA Approval of Competitive Selection Procedures

Selection of the U.S. Contractor shall be carried out by the Grantee according to its established procedures for the competitive selection of contractors with advance notice of the procurement published online through *Federal Business Opportunities (www.fedbizopps.gov)*. Upon request, the Grantee will submit these contracting procedures and related documents to USTDA for information and/or approval.

(B) USTDA Approval of Contractor Selection

The Grantee shall notify USTDA at the address of record set forth in Article 17 below upon selection of the Contractor to perform the Study. Upon approval of this selection by USTDA, the Grantee and the Contractor shall then enter into a contract for performance of the Study. The Grantee shall notify in writing the U.S. firms that submitted unsuccessful proposals to perform the Study that they were not selected.

(C) USTDA Approval of Contract Between Grantee and Contractor

The Grantee and the Contractor shall enter into a contract for performance of the Study. This contract, and any amendments thereto, including assignments and changes in the Terms of Reference, must be approved by USTDA in writing. To expedite this approval, the Grantee (or the Contractor on the Grantee's behalf) shall transmit to USTDA, at the address set forth in Article 17 below, a photocopy of an English language version of the signed contract or a final negotiated draft version of the contract.

(D) USTDA Not a Party to the Contract

It is understood by the parties that USTDA has reserved certain rights such as, but not limited to, the right to approve the terms of the contract and any amendments thereto, including assignments, the selection of all contractors, the Terms of Reference, the Final Report, and any and all documents related to any contract funded under the Grant Agreement. The parties hereto further understand and agree that USTDA, in reserving any or all of the foregoing approval rights, has acted solely as a financing entity to assure the proper use of United States Government funds, and that any decision by USTDA to exercise or refrain from exercising these approval rights shall be made as a financier in the course of funding the Study and shall not be construed as making USTDA a party to the contract. The parties hereto understand and agree that USTDA may, from time to time, exercise the foregoing approval rights, or discuss matters related to these rights and the Project with the parties to the contract or any subcontract, jointly or separately, without thereby incurring any responsibility or liability to such parties. Any approval or failure to approve by USTDA shall not bar the Grantee or USTDA from asserting any right they might have against the

Contractor, or relieve the Contractor of any liability which the Contractor might otherwise have to the Grantee or USTDA.

(E) Grant Agreement Controlling

Regardless of USTDA approval, the rights and obligations of any party to the contract or subcontract thereunder must be consistent with this Grant Agreement. In the event of any inconsistency between the Grant Agreement and any contract or subcontract funded by the Grant Agreement, the Grant Agreement shall be controlling.

6. Disbursement Procedures

(A) USTDA Approval of Contract Required

USTDA will make disbursements of Grant funds directly to the Contractor only after USTDA approves the Grantee's contract with the Contractor.

(B) Contractor Invoice Requirements

The Grantee should request disbursement of funds by USTDA to the Contractor for performance of the Study by submitting invoices in accordance with the procedures set forth in the USTDA Mandatory Clauses in Annex II.

7. Effective Date

The effective date of this Grant Agreement ("Effective Date") shall be the date of signature by both parties or, if the parties sign on different dates, the date of the last signature.

8. Study Schedule

(A) Study Completion Date

The completion date for the Study, which is December 31, 2011, is the date by which the parties estimate that the Study will have been completed.

(B) Time Limitation on Disbursement of USTDA Grant Funds

Except as USTDA may otherwise agree, (a) no USTDA funds may be disbursed under this Grant Agreement for goods and services which are provided prior to the Effective Date of the Grant Agreement; and (b) all funds made available under the Grant Agreement must be disbursed within four (4) years from the Effective Date of the Grant Agreement.

9. USTDA Mandatory Clauses

All contracts funded under this Grant Agreement shall include the USTDA mandatory clauses set forth in Annex II to this Grant Agreement. All subcontracts funded or partially funded with USTDA Grant funds shall include the USTDA mandatory clauses, except for clauses B(1), G, H, I, and J.

10. Use of U.S. Carriers

(A) Air

Transportation by air of persons or property funded under the Grant Agreement shall be on U.S. flag carriers in accordance with the Fly America Act, 49 U.S.C. 40118, to the extent service by such carriers is available, as provided under applicable U.S. Government regulations.

(B) Marine

Transportation by sea of property funded under the Grant Agreement shall be on U.S. carriers in accordance with U.S. cargo preference law.

11. Nationality, Source and Origin

Except as USTDA may otherwise agree, the following provisions shall govern the delivery of goods and services funded by USTDA under the Grant Agreement: (a) for professional services, the Contractor must be either a U.S. firm or U.S. individual; (b) the Contractor may use U.S. subcontractors without limitation, but the use of subcontractors from Host Country may not exceed twenty percent (20%) of the USTDA Grant amount and may only be used for specific services from the Terms of Reference identified in the subcontract; (c) employees of U.S. Contractor or U.S. subcontractor firms responsible for professional services shall be U.S. citizens or non-U.S. citizens lawfully admitted for permanent residence in the U.S.; (d) goods purchased for performance of the Study and associated delivery services (e.g., international transportation and insurance) must have their nationality, source and origin in the United States; and (e) goods and services incidental to Study support (e.g., local lodging, food, and transportation) in Host Country are not subject to the above restrictions. USTDA will make available further details concerning these provisions upon request.

12. Taxes

USTDA funds provided under the Grant Agreement shall not be used to pay any taxes, tariffs, duties, fees or other levies imposed under laws in effect in Host Country. Neither the Grantee nor the Contractor will seek reimbursement from USTDA for such taxes, tariffs, duties, fees or other levies.

13. Cooperation Between Parties and Follow-Up

The parties will cooperate to assure that the purposes of the Grant Agreement are accomplished. For five (5) years following receipt by USTDA of the Final Report (as defined in Clause I of Annex II), the Grantee agrees to respond to any reasonable inquiries from USTDA about the status of the Project.

14. Implementation Letters

To assist the Grantee in the implementation of the Study, USTDA may, from time to time, issue implementation letters that will provide additional information about matters covered by the Grant Agreement. The parties may also use jointly agreed upon implementation letters to confirm and record their mutual understanding of matters covered by the Grant Agreement.

15. Recordkeeping and Audit

The Grantee agrees to maintain books, records, and other documents relating to the Study and the Grant Agreement adequate to demonstrate implementation of its responsibilities under the Grant Agreement, including the selection of contractors, receipt and approval of contract deliverables, and approval or disapproval of contractor invoices for payment by USTDA. Such books, records, and other documents shall be separately maintained for three (3) years after the date of the final disbursement by USTDA. The Grantee shall afford USTDA or its authorized representatives the opportunity at reasonable times to review books, records, and other documents relating to the Study and the Grant Agreement.

16. Representation of Parties

For all purposes relevant to the Grant Agreement, the Government of the United States of America will be represented by the U. S. Ambassador to Host Country or USTDA and Grantee will be represented by the Chief Engineer. The parties hereto may, by written notice, designate additional representatives for all purposes under the Grant Agreement.

17. Addresses of Record for Parties

Any notice, request, document, or other communication submitted by either party to the other under the Grant Agreement shall be in writing or through a wire or electronic medium which produces a tangible record of the transmission, such as a telegram, cable or facsimile, and will be deemed duly given or sent when delivered to such party at the following:

To: Mr. Tulbai Abdiev
Chief Engineer
National Company "Kazakhstan Temir Zholy"

#6 Konaev Street
010000 Astana
Republic of Kazakhstan

Phone: 7 (7172) 60 43 06
Fax: 7 (7172) 60 40 73
Email: Abdiev_T@railways.kz

To: U.S. Trade and Development Agency
1000 Wilson Boulevard, Suite 1600
Arlington, Virginia 22209-3901
USA

Phone: (703) 875-4357
Fax: (703) 875-4009

All such communications shall be in English, unless the parties otherwise agree in writing. In addition, the Grantee shall provide the Commercial Section of the U.S. Embassy in Host Country with a copy of each communication sent to USTDA.

Any communication relating to this Grant Agreement shall include the following fiscal data:

Appropriation No.:	11X1001
Activity No.:	2010-81027A
Reservation No.:	2010810033
Grant No.:	GH2010810010

Appropriation No.:	119/101001
Activity No.:	2010-81027A
Reservation No.:	2010810033
Grant No.:	GH2010810010

18. Termination Clause

Either party may terminate the Grant Agreement by giving the other party thirty (30) days advance written notice. The termination of the Grant Agreement will end any obligations of the parties to provide financial or other resources for the Study, except for payments which they are committed to make pursuant to noncancellable commitments entered into with third parties prior to the written notice of termination.

19. Non-waiver of Rights and Remedies

No delay in exercising any right or remedy accruing to either party in connection with the Grant Agreement shall be construed as a waiver of such right or remedy.

20. U.S. Technology and Equipment

By funding this Study, USTDA seeks to promote the project objectives of the Host Country through the use of U.S. technology, goods, and services. In recognition of this purpose, the Grantee agrees that it will allow U.S. suppliers to compete in the procurement of technology, goods and services needed for Project implementation.

[THE REMAINDER OF THIS PAGE IS INTENTIONALLY LEFT BLANK]

IN WITNESS WHEREOF, the Government of the United States of America and Kazakhstan Temir Zholy, each acting through its duly authorized representative, have caused this Agreement to be signed in the English language in their names and delivered as of the day and year written below. In the event that this Grant Agreement is signed in more than one language, the English language version shall govern.

For the Government of the United States of America

By:_____

Date: SEPTEMBER 10, 2010
ASTANA

Witnessed:

By:_____

For Kazakhstan Temir Zholy

By:_____

Date: SEPTEMBER 10, 2010
ASTANA

Witnessed:

By:_____

Annex I -- Terms of Reference

Annex II -- USTDA Mandatory Clauses

Annex I

Terms of Reference (TOR)

The objective of this Study is to provide the Grantee with technical and economic information to support their decision to make capital investments on selected corridors or system-wide in a new signaling system or systems ("implementation"). The system(s) should support achievement of the Grantee's service goals safely, efficiently and at the best lifecycle cost.

The Study will examine three railway corridor segments (the "corridors") that the Grantee considers representative of the national network. These corridors are:

1) Shymkent – Qazaly
   a) Route Kilometers: 279
   b) No. of Switches: 1,273
2) Qazaly – Qandyaghash
   a) Route Kilometers: 617
   b) No. of Switches: 700
3) Almaty – Aqtoghay
   a) Route Kilometers: 460
   b) No. of Switches: 566

The Contractor shall perform the following Tasks to complete the Study.

Task 1 – Data Review and Corridor Survey

a. Data Review:

The Contractor shall collect and review with the Grantee the current technical state of the system and operations to include: infrastructure; rolling stock; signaling, control and telecommunications, systems interfaces; and operations practices and management. Relevant national and international standards, laws, rules and regulations currently applicable to rail traffic control on the Grantee's network will be identified and reviewed. The Contractor shall collect and review the Grantee's detailed projections for revenues and expenditures for the study corridors and the system as a whole. The Contractor shall identify and review current and planned projects at the Grantee relevant to enhancement or replacement of signaling and communications systems. This task will include review of the following specific documents:

1. "Development Strategy of JSC Kazakhstan Temir Zholy to the Year 2020".
2. "Using Transit Transportation Potential of Central Asian Countries: Challenges and Opportunities"; by M. M. Bekmagambetov, President of the Institute for Research and Science.
3. "The Main Problems Analysis and Propositions to the Rail Transport Reform and Development Strategy of the Republic of Kazakhstan"; by N. Issingarin, Ph.D.
4. "Topical Problems of the Railroad Transport in Kazakhstan"; by Various KTZ Authors.

b. Field Survey of Study Corridors

The Contractor shall conduct a field survey including the three corridors focusing on signaling and communications infrastructure and traffic management procedures. This survey shall include:

1. Physical inspection of the study corridors signaling and communications infrastructure, such as by high-rail inspection car, by automobile along adjacent access roads, or locomotive as appropriate;
2. Inspection of the national dispatch/traffic control center and interviews with management.
3. Inspection of regional dispatch centers controlling the corridors under study and interviews with management.
4. Inspection of selected or representative terminals/yards/stations and associated interlockings and interviews with management.
5. Inspection of representative rolling stock in use on the study corridors.

Deliverable: Upon completion of the task, the Contractor shall prepare a survey report detailing findings of the current status of the system and the projections for traffic, revenue and maintenance and capital investment expenditures for the projection period of twenty (20) years. The report shall include photographs of representative equipment and installations relevant to the study activities as well as explanatory maps and diagrams illustrating the corridor and national system signaling and communications infrastructure. All drawings, map, graphics and exhibits shall provide appropriate size scale references and geospatial data tags and be provided in the native file formats (.dwg, .shp, .svg, etc.), as well as in Adobe Acrobat .pdf versions.

Task 2 – Develop Corridor Performance Requirements

Taking into account the data collected under the previous tasks the Contractor shall work with the Grantee to develop financial and operational performance requirements for each of the study corridors. These performance requirements will be used to drive the systems and practices choices for the selected scenarios in the subsequent tasks. The performance requirements will take into account the current infrastructure situation, capacity and condition, current and projected traffic levels, current and projected train speeds and operating plans, and current plans for maintenance and capital investment affecting the aforementioned. These variables will be related to the Grantee's year-by-year projections for revenues and expenditures for the study corridors. The performance requirements shall be determined for a study period of twenty (20) years.

Deliverable: Upon completion of the task, the Contractor shall prepare a report detailing the current and projected performance requirements for each of the study corridors.

Task 3 - Assessment of Sources of Supply

Based on the requirements identified in Task 2, the Contractor shall perform a survey of the US sources of supply. This assessment will determine the range and capabilities of product offerings of goods, services and technologies for railway traffic control systems appropriate to support the envisioned scope of operations and performance goals on the study corridors. This task will include identification of suppliers for traditional centralized traffic control systems as well as offerings for the advanced/positive train control systems under development and in early implementation.

Deliverable: Upon completion of the task, the Contractor shall prepare a report that describes and assesses the market offerings of goods for railway traffic control systems by US vendors. The report will list the potential suppliers, identifying the range of goods, services and technologies offered. Business name, point(s) of contact, addresses, telephones, e-mail, and fax numbers shall be included for each identified potential US source of supply.

Task 4 – Develop Technical Scenario 1 and Cost Estimate: Modern CTC

The Contractor shall develop with the Grantee a technical plan and cost estimate for implementation of a modern centralized traffic control system appropriate to support the performance requirements. This will include proven technologies such as automatic block electrical signaling utilizing physical track circuits, computer aided dispatch (CAD), traffic planning software, and automatic train stop (ATS) and automatic train protection (ATP). The cost estimate will cover a life cycle period of twenty (20) years, identifying the central office, wayside, onboard and communications systems links and the corresponding key physical components and quantities. The estimate will include the maintenance costs of the system for the projection period and include estimated personnel costs for operating and maintenance staff under the new system.

Deliverable: Upon completion of the task, the Contractor shall prepare a written report including a technical implementation scenario and associated cost estimate. The cost estimate will be provided in Microsoft Excel in a format to be agreed upon with the Grantee. Assumptions and calculations supporting the cost estimate shall be fully documented in the spreadsheet or written report.

Task 5 – Develop Technical Scenario 2 and Cost Estimate: ACTC

The Contractor shall develop a technical plan and cost estimate for implementation of a traffic control system utilizing advanced/positive train control technologies appropriate to support the performance requirements previously identified. This will be a life cycle cost estimate for a period of twenty (20) years identifying the central office, wayside, onboard and communications systems links and the corresponding key components and quantities.

The estimate will include the maintenance costs of the system for the projection period and include estimated personnel costs for operating and maintenance staff under the new system.

The Contractor shall take care to clearly identify changes in physical infrastructure and fundamental operating practices possible with A/PTC as differentiated from the traditional systems such as flexible block operations and elimination of line-side signaling equipment, physical track circuits and physical data transmission links. The analysis shall also carefully assess the ability of existing infrastructure to support wireless transmission of safety critical data and identify costs and technical requirements for enhancements or new communications equipment and systems that would be required.

Deliverable: Upon completion of the task, the Contractor shall prepare a report including a technical scenario and associated cost estimate. The estimate will be provided in Microsoft Excel format in a format to be agreed upon with the Grantee. Assumptions and calculations supporting cost estimates shall be documented in the report.

Task 6 – Economic and Financial Analysis

Based on the life cycle cost analyses performed in previous tasks for the study corridor, the Contractor shall complete a cost-benefit analysis of implementation based on the following scenarios over a twenty (20) year time period:

- **Baseline Case:** Current railway traffic control systems and procedures are maintained on the study corridors. Minimal maintenance is performed to maintain the assets in the state of current repair.

- **Scenario One:** The current railway traffic control systems, hardware, software and procedures are replaced with the package of systems and procedures associated with modern centralized railway traffic control identified in task 4. Following implementation, adequate maintenance is performed to maintain the assets in a state of good repair for the projection period.

- **Scenario Two:** The current railway traffic control systems, hardware, software and procedures are upgraded to the package of systems and procedures associated with advanced/positive train control identified in task 5. Following implementation, adequate maintenance is performed to maintain the asset in a state of good repair for the projection period.

The Contractor shall discount benefits and costs to present value based upon a discount rate provided by the Grantee and determined as appropriate for the projection period and nature of the anticipated capital investments.

The benefits analysis shall be focused on corridor and system wide operating revenues accruing to the Grantee that will be reflected in their financial results. The analysis may

include monetization of additional benefits accruing to parties outside of the railroad system. For example reductions in emissions - such as particulate matter, NO_x, or CO_2 - attributed to the improvements permitting the railway to capture greater shares of road passenger and freight traffic. These benefits shall be identified by the Grantee and the methodology for quantifying those benefits shall be explained.

The cost analysis shall include identification of the expected sources of funding for each scenario for an implementation over the projection period broken out at a minimum to the categories of: corridor specific revenue, railway system (Grantee) revenue, other government funds, and external funds such as multilateral grants or financing.

The Contractor shall analyze market conditions, availability of local resources to support the Project, existing supply agreements/off-take agreements and competing alternative methods of achieving the same or similar Project objectives. A description shall be provided of the planned host country financing mechanism for implementation based on the three scenarios. This analysis will include the anticipated decision making process, procurement and disbursement mechanisms and funding timelines. The Contractor shall identify any potential for additional or supplementary equity and debt financing that could support or complement the Host Country financing plan such as mechanisms provided by the US Export-Import Bank and the Overseas Private Investment Corporation (OPIC) that can reduce costs and mitigate risks for US suppliers.

Deliverable: The Contractor shall prepare a benefit cost analysis of illustrating the corridor scenarios described. This analysis will integrate the outputs of tasks 4 and 5 as the cost component of the analysis. The core of this analysis shall be a comprehensive Microsoft Excel based spreadsheet with present value results shown for each year of the projection period. Supporting text shall describe the methodology and assumptions for this spreadsheet document.

Task 7 – Environmental Analysis

The Contractor shall perform a preliminary review of the Project's anticipated impact on the environment with reference to local requirements and those of multi-lateral lending agencies (such as the World Bank). This review shall identify potential negative impacts of the scenarios and discuss the extent to which they can be mitigated. This shall include the identification of steps that will need to be undertaken by the Grantee subsequent to the study's completion and prior to Project implementation.

Deliverable: Upon completion of the task, the Contractor shall prepare a written report with preliminary review of Project anticipated environmental impact.

Task 8 – Implementation Plan Development

The Contractor shall prepare a plan for implementation of the systems types examined in two scenarios: Corridor and System-Wide

This plan shall provide the necessary level of detail under each scenario to support development of standard procurement documentation used by the Grantee and be in a format compatible with established procedures of the Grantee for tenders conducted by international competitive bidding (ICB). This plan will also identify major changes to the Grantee's operating procedures necessary in order to take full advantage of the capabilities of the new system. The major components of the plans will include:

- a top level **budget** for system acquisition, detailed design, engineering, installation, testing, training to achieve full functionality and provision of five years system lifecycle vendor and 3rd party support;
- a top level implementation **schedule**, in written and Gantt chart format, for system acquisition, detailed design, engineering, installation testing, training and five years of system lifecycle vendor and 3rd party support;
- top level system performance requirements and top level technical specifications including;
- An **operating plan report** with recommendations for changes to Grantee operating procedures and regulations necessary to take full advantage of the capabilities of the new system.

Deliverable: The Contractor shall prepare a written report detailing distinct individual implementation plans for the two scenarios. These implementation plans should be of a level of detail and in a format suitable to provide the core elements of typical Host Country procurement documentation used for ICB.

a. Corridor Implementation Plan

b. System-wide Implementation Plan

Task 9 – Host Country Development Impact Analysis

The Contractor shall perform an analysis of the Development Impact that is likely to result if the Project is implemented in accordance with the plans developed in task 8. While specific focus shall be paid to the immediate impact of the implementation, analysis shall include any additional developmental benefits that may result from the Project's implementation, including spin-off and demonstration effects. This analysis shall include assessment of each of the following categories with respect to the implementation's potential Development Impact:

1.) Infrastructure
2.) Market-Oriented Reform
3.) Human Capacity Building

4.) Technology Transfer and Productivity Enhancement
5.) Other - Safety

Deliverable: Upon completion of the task, the Contractor shall prepare a report identifying and describing quantified development impacts of the two scenarios of Project implementation in the Host Country including the following categories:

1. Infrastructure:
   a) Quantify the major physical enhancements to the infrastructure to include automation of major control and monitoring points such as grade crossings, switches and interlockings.
   b) Quantify improvements in operational efficiency including on-time performance, dwell time and freight and passenger volumes over time.
2. Market-Oriented Reform:
   a) Quantify anticipated freight and passenger service improvements that will support the continued growth and development of Kazakhstan's market economy, particularly the export sector.
3. Human Capacity Building:
   a) Estimate person-days of technical and management training to be provided to what number and category of employees of the Grantee.
4. Technology Transfer and Productivity Enhancement:
   a) Identify opportunities for labor productivity enhancement and quantify by position type.
   b) Identify specific traffic control practices, equipment and systems that will be replaced with more advanced technology.
5. Other – Safety:
   a) Identify major accident and incident types that the new system will reduce or eliminate – to include collisions, derailments and grade-crossing accidents - and project forward the anticipated improvement based on the Grantee's historical safety records.

Task 10 - Final Report

The Contractor shall prepare and provide to the Grantee and to USTDA a Final Report in accordance with Clause I of Annex II of the Grant Agreement. Each of the above tasks in this Terms of Reference must be distinctly set forth in the Final Report in a substantive and comprehensive manner, and the Final Report shall include all corresponding deliverables. The Final Report shall contain an executive summary. In addition to any other required deliverables in accordance with Clause I of Annex II of the Grant Agreement, the Contractor shall provide both the Grantee and USTDA with a Public Version of the Final Report on CD-ROM. The CD-ROM version of the Final Report shall include:

- Adobe Acrobat readable copies of all documents;
- Source files for all drawings in AutoCAD or Visio format, and;
- Source files for all documents in MS Office 2000 or later formats (note: these files may be provided in equivalent readable formats.)

Notes:

(1) **The Contractor is responsible for compliance with U.S. export licensing requirements, if applicable, in the performance of the Terms of Reference.**

(2) **The Contractor and the Grantee shall be careful to ensure that the public version of the Final Report contains no security or confidential information.**

(3) **The Grantee and USTDA shall have an irrevocable, worldwide, royalty-free, non-exclusive right to use and distribute the Final Report and all work product that is developed under these Terms of Reference.**

Annex II

USTDA Mandatory Contract Clauses

A. USTDA Mandatory Clauses Controlling

The parties to this contract acknowledge that this contract is funded in whole or in part by the U.S. Trade and Development Agency ("USTDA") under the Grant Agreement between the Government of the United States of America acting through USTDA and Kazakhstan Temir Zholy ("Client"), dated _____ ("Grant Agreement"). The Client has selected _____ ("Contractor") to perform the feasibility study ("Study") for the Rail Signaling and Train Control System project ("Project") in Kazakhstan ("Host Country"). Notwithstanding any other provisions of this contract, the following USTDA mandatory contract clauses shall govern. All subcontracts entered into by Contractor funded or partially funded with USTDA Grant funds shall include these USTDA mandatory contract clauses, except for clauses B(1), G, H, I, and J. In addition, in the event of any inconsistency between the Grant Agreement and any contract or subcontract thereunder, the Grant Agreement shall be controlling.

B. USTDA as Financier

(1) USTDA Approval of Contract

All contracts funded under the Grant Agreement, and any amendments thereto, including assignments and changes in the Terms of Reference, must be approved by USTDA in writing in order to be effective with respect to the expenditure of USTDA Grant funds. USTDA will not authorize the disbursement of USTDA Grant funds until the contract has been formally approved by USTDA or until the contract conforms to modifications required by USTDA during the contract review process.

(2) USTDA Not a Party to the Contract

It is understood by the parties that USTDA has reserved certain rights such as, but not limited to, the right to approve the terms of this contract and amendments thereto, including assignments, the selection of all contractors, the Terms of Reference, the Final Report, and any and all documents related to any contract funded under the Grant Agreement. The parties hereto further understand and agree that USTDA, in reserving any or all of the foregoing approval rights, has acted solely as a financing entity to assure the proper use of United States Government funds, and that any decision by USTDA to exercise or refrain from exercising these approval rights shall be made as a financier in the course of financing the Study and shall not be construed as making USTDA a party to the contract. The parties hereto understand and agree that USTDA may, from time to time, exercise the foregoing approval rights, or discuss matters related to these rights and the Project with the parties to the contract or any subcontract, jointly or separately, without thereby incurring any responsibility or liability to such parties. Any approval or failure to approve by USTDA shall not

bar the Client or USTDA from asserting any right they might have against the Contractor, or relieve the Contractor of any liability which the Contractor might otherwise have to the Client or USTDA.

C. Nationality, Source and Origin

Except as USTDA may otherwise agree, the following provisions shall govern the delivery of goods and services funded by USTDA under the Grant Agreement: (a) for professional services, the Contractor must be either a U.S. firm or U.S. individual; (b) the Contractor may use U.S. subcontractors without limitation, but the use of subcontractors from Host Country may not exceed twenty percent (20%) of the USTDA Grant amount and may only be used for specific services from the Terms of Reference identified in the subcontract; (c) employees of U.S. Contractor or U.S. subcontractor firms responsible for professional services shall be U.S. citizens or non-U.S. citizens lawfully admitted for permanent residence in the U.S.; (d) goods purchased for performance of the Study and associated delivery services (e.g., international transportation and insurance) must have their nationality, source and origin in the United States; and (e) goods and services incidental to Study support (e.g., local lodging, food, and transportation) in Host Country are not subject to the above restrictions. USTDA will make available further details concerning these provisions upon request.

D. Recordkeeping and Audit

The Contractor and subcontractors funded under the Grant Agreement shall maintain, in accordance with generally accepted accounting procedures, books, records, and other documents, sufficient to reflect properly all transactions under or in connection with the contract. These books, records, and other documents shall clearly identify and track the use and expenditure of USTDA funds, separately from other funding sources. Such books, records, and documents shall be maintained during the contract term and for a period of three (3) years after final disbursement by USTDA. The Contractor and subcontractors shall afford USTDA, or its authorized representatives, the opportunity at reasonable times for inspection and audit of such books, records, and other documentation.

E. U.S. Carriers

(1) Air

Transportation by air of persons or property funded under the Grant Agreement shall be on U.S. flag carriers in accordance with the Fly America Act, 49 U.S.C. 40118, to the extent service by such carriers is available, as provided under applicable U.S. Government regulations.

(2) Marine

Transportation by sea of property funded under the Grant Agreement shall be on U.S. carriers in accordance with U.S. cargo preference law.

F. Workman's Compensation Insurance

The Contractor shall provide adequate Workman's Compensation Insurance coverage for work performed under this Contract.

G. Reporting Requirements

The Contractor shall advise USTDA by letter as to the status of the Project on March 1st annually for a period of two (2) years after completion of the Study. In addition, if at any time the Contractor receives follow-on work from the Client, the Contractor shall so notify USTDA and designate the Contractor's contact point including name, telephone, and fax number. Since this information may be made publicly available by USTDA, any information which is confidential shall be designated as such by the Contractor and provided separately to USTDA. USTDA will maintain the confidentiality of such information in accordance with applicable law.

H. Disbursement Procedures

(1) USTDA Approval of Contract

Disbursement of Grant funds will be made only after USTDA approval of this contract. To make this review in a timely fashion, USTDA must receive from either the Client or the Contractor a photocopy of an English language version of a signed contract or a final negotiated draft version to the attention of the General Counsel's office at USTDA's address listed in Clause M below.

(2) Payment Schedule Requirements

A payment schedule for disbursement of Grant funds to the Contractor shall be included in this Contract. Such payment schedule must conform to the following USTDA requirements: (1) up to twenty percent (20%) of the total USTDA Grant amount may be used as a mobilization payment; (2) all other payments, with the exception of the final payment, shall be based upon contract performance milestones; and (3) the final payment may be no less than fifteen percent (15%) of the total USTDA Grant amount, payable upon receipt by USTDA of an approved Final Report in accordance with the specifications and quantities set forth in Clause I below. Invoicing procedures for all payments are described below.

(3) Contractor Invoice Requirements

USTDA will make all disbursements of USTDA Grant funds directly to the Contractor. The Contractor must provide USTDA with an ACH Vendor Enrollment Form (available from USTDA) with the first invoice. The Client shall request disbursement of funds by

USTDA to the Contractor for performance of the contract by submitting the following to USTDA:

(a) Contractor's Invoice

The Contractor's invoice shall include reference to an item listed in the Contract payment schedule, the requested payment amount, and an appropriate certification by the Contractor, as follows:

(i) For a mobilization payment (if any):

"As a condition for this mobilization payment, the Contractor certifies that it will perform all work in accordance with the terms of its Contract with the Client. To the extent that the Contractor does not comply with the terms and conditions of the Contract, including the USTDA mandatory provisions contained therein, it will, upon USTDA's request, make an appropriate refund to USTDA. "

(ii) For contract performance milestone payments:

"The Contractor has performed the work described in this invoice in accordance with the terms of its contract with the Client and is entitled to payment thereunder. To the extent the Contractor has not complied with the terms and conditions of the Contract, including the USTDA mandatory provisions contained therein, it will, upon USTDA's request, make an appropriate refund to USTDA."

(iii) For final payment:

"The Contractor has performed the work described in this invoice in accordance with the terms of its contract with the Client and is entitled to payment thereunder. Specifically, the Contractor has submitted the Final Report to the Client, as required by the Contract, and received the Client's approval of the Final Report. To the extent the Contractor has not complied with the terms and conditions of the Contract, including the USTDA mandatory provisions contained therein, it will, upon USTDA's request, make an appropriate refund to USTDA."

(b) Client's Approval of the Contractor's Invoice

(i) The invoice for a mobilization payment must be approved in writing by the Client.

(ii) For contract performance milestone payments, the following certification by the Client must be provided on the invoice or separately:

"The services for which disbursement is requested by the Contractor have been performed satisfactorily, in accordance with applicable Contract provisions and the terms and conditions of the USTDA Grant Agreement."

(iii) For final payment, the following certification by the Client must be provided on the invoice or separately:

"The services for which disbursement is requested by the Contractor have been performed satisfactorily, in accordance with applicable Contract provisions and terms and conditions of the USTDA Grant Agreement. The Final Report submitted by the Contractor has been reviewed and approved by the Client. "

(c) USTDA Address for Disbursement Requests

Requests for disbursement shall be submitted by courier or mail to the attention of the Finance Department at USTDA's address listed in Clause M below.

(4) Termination

In the event that the Contract is terminated prior to completion, the Contractor will be eligible, subject to USTDA approval, for reasonable and documented costs which have been incurred in performing the Terms of Reference prior to termination, as well as reasonable wind down expenses. Reimbursement for such costs shall not exceed the total amount of undisbursed Grant funds. Likewise, in the event of such termination, USTDA is entitled to receive from the Contractor all USTDA Grant funds previously disbursed to the Contractor (including but not limited to mobilization payments) which exceed the reasonable and documented costs incurred in performing the Terms of Reference prior to termination.

I. USTDA Final Report

(1) Definition

"Final Report" shall mean the Final Report described in the attached Annex I Terms of Reference or, if no such "Final Report" is described therein, "Final Report" shall mean a substantive and comprehensive report of work performed in accordance with the attached Annex I Terms of Reference, including any documents delivered to the Client.

(2) Final Report Submission Requirements

The Contractor shall provide the following to USTDA:

(a) One (1) complete version of the Final Report for USTDA's records. This version shall have been approved by the Client in writing and must be in the English language. It is the responsibility of the Contractor to ensure that confidential information, if any, contained in this version be clearly marked. USTDA will maintain the confidentiality of such information in accordance with applicable law.

and

(b) One (1) copy of the Final Report suitable for public distribution ("Public Version"). The Public Version shall have been approved by the Client in writing and must be in the English language. As this version will be available for public distribution, it must not contain any confidential information. If the report in (a) above contains no confidential information, it may be used as the Public Version. In any event, the Public Version must be informative and contain sufficient Project detail to be useful to prospective equipment and service providers.

and

(c) Two (2) CD-ROMs, each containing a complete copy of the Public Version of the Final Report. The electronic files on the CD-ROMs shall be submitted in a commonly accessible read-only format. As these CD-ROMs will be available for public distribution, they must not contain any confidential information. It is the responsibility of the Contractor to ensure that no confidential information is contained on the CD-ROMs.

The Contractor shall also provide one (1) copy of the Public Version of the Final Report to the Foreign Commercial Service Officer or the Economic Section of the U.S. Embassy in Host Country for informational purposes.

(3) Final Report Presentation

All Final Reports submitted to USTDA must be paginated and include the following:

(a) The front cover of every Final Report shall contain the name of the Client, the name of the Contractor who prepared the report, a report title, USTDA's logo, USTDA's mailing and delivery addresses. If the complete version of the Final Report contains confidential information, the Contractor shall be responsible for labeling the front cover of that version of the Final Report with the term "Confidential Version." The Contractor shall be responsible for labeling the front cover of the Public Version of the Final Report with the term "Public Version." The front cover of every Final Report shall also contain the following disclaimer:

> "This report was funded by the U.S. Trade and Development Agency (USTDA), an agency of the U. S. Government. The opinions, findings, conclusions or recommendations expressed in this document are those of the author(s) and do not necessarily represent the official position or policies of USTDA. USTDA makes no representation about, nor does it accept responsibility for, the accuracy or completeness of the information contained in this report."

(b) The inside front cover of every Final Report shall contain USTDA's logo, USTDA's mailing and delivery addresses, and USTDA's mission statement.

Camera-ready copy of USTDA Final Report specifications will be available from USTDA upon request.

(c) The Contractor shall affix to the front of the CD-ROM a label identifying the Host Country, USTDA Activity Number, the name of the Client, the name of the Contractor who prepared the report, a report title, and the following language:

> "The Contractor certifies that this CD-ROM contains the Public Version of the Final Report and that all contents are suitable for public distribution."

(d) The Contractor and any subcontractors that perform work pursuant to the Grant Agreement must be clearly identified in the Final Report. Business name, point of contact, address, telephone and fax numbers shall be included for Contractor and each subcontractor.

(e) The Final Report, while aiming at optimum specifications and characteristics for the Project, shall identify the availability of prospective U.S. sources of supply. Business name, point of contact, address, telephone and fax numbers shall be included for each commercial source.

(f) The Final Report shall be accompanied by a letter or other notation by the Client which states that the Client approves the Final Report. A certification by the Client to this effect provided on or with the invoice for final payment will meet this requirement.

J. Modifications

All changes, modifications, assignments or amendments to this contract, including the appendices, shall be made only by written agreement by the parties hereto, subject to written USTDA approval.

K. Study Schedule

(1) Study Completion Date

The completion date for the Study, which is December 31, 2011, is the date by which the parties estimate that the Study will have been completed.

(2) Time Limitation on Disbursement of USTDA Grant Funds

Except as USTDA may otherwise agree, (a) no USTDA funds may be disbursed under this contract for goods and services which are provided prior to the Effective Date of the Grant Agreement; and (b) all funds made available under the Grant Agreement must be disbursed within four (4) years from the Effective Date of the Grant Agreement.

L. Business Practices

The Contractor agrees not to pay, promise to pay, or authorize the payment of any money or anything of value, directly or indirectly, to any person (whether a governmental official or private individual) for the purpose of illegally or improperly inducing anyone to take any action favorable to any party in connection with the Study. The Client agrees not to receive any such payment. The Contractor and the Client agree that each will require that any agent or representative hired to represent them in connection with the Study will comply with this paragraph and all laws which apply to activities and obligations of each party under this Contract, including but not limited to those laws and obligations dealing with improper payments as described above.

M. USTDA Address and Fiscal Data

Any communication with USTDA regarding this Contract shall be sent to the following address and include the fiscal data listed below:

U.S. Trade and Development Agency
1000 Wilson Boulevard, Suite 1600
Arlington, Virginia 22209-3901
USA

Phone: (703) 875-4357
Fax: (703) 875-4009

Fiscal Data:

Appropriation No.:	11X1001
Activity No.:	2010-81027A
Reservation No.:	2010810033
Grant No.:	GH2010810010

Appropriation No.:	119/101001
Activity No.:	2010-81027A
Reservation No.:	2010810033
Grant No.:	GH2010810010

N. Definitions

All capitalized terms not otherwise defined herein shall have the meaning set forth in the Grant Agreement.

O. Taxes

USTDA funds provided under the Grant Agreement shall not be used to pay any taxes, tariffs, duties, fees or other levies imposed under laws in effect in Host Country. Neither the Client nor the Contractor will seek reimbursement from USTDA for such taxes, tariffs, duties, fees or other levies.

ANNEX 5

Annex I

Terms of Reference (TOR)

The objective of this Study is to provide the Grantee with technical and economic information to support their decision to make capital investments on selected corridors or system-wide in a new signaling system or systems ("implementation"). The system(s) should support achievement of the Grantee's service goals safely, efficiently and at the best lifecycle cost.

The Study will examine three railway corridor segments (the "corridors") that the Grantee considers representative of the national network. These corridors are:

1) Shymkent – Qazaly
   a) Route Kilometers: 279
   b) No. of Switches: 1,273
2) Qazaly – Qandyaghash
   a) Route Kilometers: 617
   b) No. of Switches: 700
3) Almaty – Aqtoghay
   a) Route Kilometers: 460
   b) No. of Switches: 566

The Contractor shall perform the following Tasks to complete the Study.

Task 1 – Data Review and Corridor Survey

a. Data Review:

The Contractor shall collect and review with the Grantee the current technical state of the system and operations to include: infrastructure; rolling stock; signaling, control and telecommunications, systems interfaces; and operations practices and management. Relevant national and international standards, laws, rules and regulations currently applicable to rail traffic control on the Grantee's network will be identified and reviewed. The Contractor shall collect and review the Grantee's detailed projections for revenues and expenditures for the study corridors and the system as a whole. The Contractor shall identify and review current and planned projects at the Grantee relevant to enhancement or replacement of signaling and communications systems. This task will include review of the following specific documents:

1. "Development Strategy of JSC Kazakhstan Temir Zholy to the Year 2020".
2. "Using Transit Transportation Potential of Central Asian Countries: Challenges and Opportunities"; by M. M. Bekmagambetov, President of the Institute for Research and Science.
3. "The Main Problems Analysis and Propositions to the Rail Transport Reform and Development Strategy of the Republic of Kazakhstan"; by N. Issingarin, Ph.D.
4. "Topical Problems of the Railroad Transport in Kazakhstan"; by Various KTZ Authors.

b. Field Survey of Study Corridors

The Contractor shall conduct a field survey including the three corridors focusing on signaling and communications infrastructure and traffic management procedures. This survey shall include:

1. Physical inspection of the study corridors signaling and communications infrastructure, such as by high-rail inspection car, by automobile along adjacent access roads, or locomotive as appropriate;
2. Inspection of the national dispatch/traffic control center and interviews with management.
3. Inspection of regional dispatch centers controlling the corridors under study and interviews with management.
4. Inspection of selected or representative terminals/yards/stations and associated interlockings and interviews with management.
5. Inspection of representative rolling stock in use on the study corridors.

Deliverable: Upon completion of the task, the Contractor shall prepare a survey report detailing findings of the current status of the system and the projections for traffic, revenue and maintenance and capital investment expenditures for the projection period of twenty (20) years. The report shall include photographs of representative equipment and installations relevant to the study activities as well as explanatory maps and diagrams illustrating the corridor and national system signaling and communications infrastructure. All drawings, map, graphics and exhibits shall provide appropriate size scale references and geospatial data tags and be provided in the native file formats (.dwg, .shp, .svg, etc.), as well as in Adobe Acrobat .pdf versions.

Task 2 – Develop Corridor Performance Requirements

Taking into account the data collected under the previous tasks the Contractor shall work with the Grantee to develop financial and operational performance requirements for each of the study corridors. These performance requirements will be used to drive the systems and practices choices for the selected scenarios in the subsequent tasks. The performance requirements will take into account the current infrastructure situation, capacity and condition, current and projected traffic levels, current and projected train speeds and operating plans, and current plans for maintenance and capital investment affecting the aforementioned. These variables will be related to the Grantee's year-by-year projections for revenues and expenditures for the study corridors. The performance requirements shall be determined for a study period of twenty (20) years.

Deliverable: Upon completion of the task, the Contractor shall prepare a report detailing the current and projected performance requirements for each of the study corridors.

Task 3 - Assessment of Sources of Supply

Based on the requirements identified in Task 2, the Contractor shall perform a survey of the US sources of supply. This assessment will determine the range and capabilities of product offerings of goods, services and technologies for railway traffic control systems appropriate to support the envisioned scope of operations and performance goals on the study corridors. This task will include identification of suppliers for traditional centralized traffic control systems as well as offerings for the advanced/positive train control systems under development and in early implementation.

Deliverable: Upon completion of the task, the Contractor shall prepare a report that describes and assesses the market offerings of goods for railway traffic control systems by US vendors. The report will list the potential suppliers, identifying the range of goods, services and technologies offered. Business name, point(s) of contact, addresses, telephones, e-mail, and fax numbers shall be included for each identified potential US source of supply.

Task 4 – Develop Technical Scenario 1 and Cost Estimate: Modern CTC

The Contractor shall develop with the Grantee a technical plan and cost estimate for implementation of a modern centralized traffic control system appropriate to support the performance requirements. This will include proven technologies such as automatic block electrical signaling utilizing physical track circuits, computer aided dispatch (CAD), traffic planning software, and automatic train stop (ATS) and automatic train protection (ATP). The cost estimate will cover a life cycle period of twenty (20) years, identifying the central office, wayside, onboard and communications systems links and the corresponding key physical components and quantities. The estimate will include the maintenance costs of the system for the projection period and include estimated personnel costs for operating and maintenance staff under the new system.

Deliverable: Upon completion of the task, the Contractor shall prepare a written report including a technical implementation scenario and associated cost estimate. The cost estimate will be provided in Microsoft Excel in a format to be agreed upon with the Grantee. Assumptions and calculations supporting the cost estimate shall be fully documented in the spreadsheet or written report.

Task 5 – Develop Technical Scenario 2 and Cost Estimate: ACTC

The Contractor shall develop a technical plan and cost estimate for implementation of a traffic control system utilizing advanced/positive train control technologies appropriate to support the performance requirements previously identified. This will be a life cycle cost estimate for a period of twenty (20) years identifying the central office, wayside, onboard and communications systems links and the corresponding key components and quantities.

The estimate will include the maintenance costs of the system for the projection period and include estimated personnel costs for operating and maintenance staff under the new system.

The Contractor shall take care to clearly identify changes in physical infrastructure and fundamental operating practices possible with A/PTC as differentiated from the traditional systems such as flexible block operations and elimination of line-side signaling equipment, physical track circuits and physical data transmission links. The analysis shall also carefully assess the ability of existing infrastructure to support wireless transmission of safety critical data and identify costs and technical requirements for enhancements or new communications equipment and systems that would be required.

Deliverable: Upon completion of the task, the Contractor shall prepare a report including a technical scenario and associated cost estimate. The estimate will be provided in Microsoft Excel format in a format to be agreed upon with the Grantee. Assumptions and calculations supporting cost estimates shall be documented in the report.

Task 6 – Economic and Financial Analysis

Based on the life cycle cost analyses performed in previous tasks for the study corridor, the Contractor shall complete a cost-benefit analysis of implementation based on the following scenarios over a twenty (20) year time period:

- **Baseline Case:** Current railway traffic control systems and procedures are maintained on the study corridors. Minimal maintenance is performed to maintain the assets in the state of current repair.

- **Scenario One:** The current railway traffic control systems, hardware, software and procedures are replaced with the package of systems and procedures associated with modern centralized railway traffic control identified in task 4. Following implementation, adequate maintenance is performed to maintain the assets in a state of good repair for the projection period.

- **Scenario Two:** The current railway traffic control systems, hardware, software and procedures are upgraded to the package of systems and procedures associated with advanced/positive train control identified in task 5. Following implementation, adequate maintenance is performed to maintain the asset in a state of good repair for the projection period.

The Contractor shall discount benefits and costs to present value based upon a discount rate provided by the Grantee and determined as appropriate for the projection period and nature of the anticipated capital investments.

The benefits analysis shall be focused on corridor and system wide operating revenues accruing to the Grantee that will be reflected in their financial results. The analysis may

include monetization of additional benefits accruing to parties outside of the railroad system. For example reductions in emissions - such as particulate matter, NO_x, or CO_2 - attributed to the improvements permitting the railway to capture greater shares of road passenger and freight traffic. These benefits shall be identified by the Grantee and the methodology for quantifying those benefits shall be explained.

The cost analysis shall include identification of the expected sources of funding for each scenario for an implementation over the projection period broken out at a minimum to the categories of: corridor specific revenue, railway system (Grantee) revenue, other government funds, and external funds such as multilateral grants or financing.

The Contractor shall analyze market conditions, availability of local resources to support the Project, existing supply agreements/off-take agreements and competing alternative methods of achieving the same or similar Project objectives. A description shall be provided of the planned host country financing mechanism for implementation based on the three scenarios. This analysis will include the anticipated decision making process, procurement and disbursement mechanisms and funding timelines. The Contractor shall identify any potential for additional or supplementary equity and debt financing that could support or complement the Host Country financing plan such as mechanisms provided by the US Export-Import Bank and the Overseas Private Investment Corporation (OPIC) that can reduce costs and mitigate risks for US suppliers.

Deliverable: The Contractor shall prepare a benefit cost analysis of illustrating the corridor scenarios described. This analysis will integrate the outputs of tasks 4 and 5 as the cost component of the analysis. The core of this analysis shall be a comprehensive Microsoft Excel based spreadsheet with present value results shown for each year of the projection period. Supporting text shall describe the methodology and assumptions for this spreadsheet document.

Task 7 – Environmental Analysis

The Contractor shall perform a preliminary review of the Project's anticipated impact on the environment with reference to local requirements and those of multi-lateral lending agencies (such as the World Bank). This review shall identify potential negative impacts of the scenarios and discuss the extent to which they can be mitigated. This shall include the identification of steps that will need to be undertaken by the Grantee subsequent to the study's completion and prior to Project implementation.

Deliverable: Upon completion of the task, the Contractor shall prepare a written report with preliminary review of Project anticipated environmental impact.

Task 8 – Implementation Plan Development

The Contractor shall prepare a plan for implementation of the systems types examined in two scenarios: Corridor and System-Wide

This plan shall provide the necessary level of detail under each scenario to support development of standard procurement documentation used by the Grantee and be in a format compatible with established procedures of the Grantee for tenders conducted by international competitive bidding (ICB). This plan will also identify major changes to the Grantee's operating procedures necessary in order to take full advantage of the capabilities of the new system. The major components of the plans will include:

- a top level **budget** for system acquisition, detailed design, engineering, installation, testing, training to achieve full functionality and provision of five years system lifecycle vendor and 3rd party support;
- a top level implementation **schedule**, in written and Gantt chart format, for system acquisition, detailed design, engineering, installation testing, training and five years of system lifecycle vendor and 3rd party support;
- top level system performance requirements and top level technical specifications including;
- An **operating plan report** with recommendations for changes to Grantee operating procedures and regulations necessary to take full advantage of the capabilities of the new system.

Deliverable: The Contractor shall prepare a written report detailing distinct individual implementation plans for the two scenarios. These implementation plans should be of a level of detail and in a format suitable to provide the core elements of typical Host Country procurement documentation used for ICB.

a. Corridor Implementation Plan

b. System-wide Implementation Plan

Task 9 – Host Country Development Impact Analysis

The Contractor shall perform an analysis of the Development Impact that is likely to result if the Project is implemented in accordance with the plans developed in task 8. While specific focus shall be paid to the immediate impact of the implementation, analysis shall include any additional developmental benefits that may result from the Project's implementation, including spin-off and demonstration effects. This analysis shall include assessment of each of the following categories with respect to the implementation's potential Development Impact:

1.) Infrastructure
2.) Market-Oriented Reform
3.) Human Capacity Building

4.) Technology Transfer and Productivity Enhancement
5.) Other - Safety

Deliverable: Upon completion of the task, the Contractor shall prepare a report identifying and describing quantified development impacts of the two scenarios of Project implementation in the Host Country including the following categories:

1. Infrastructure:
   a) Quantify the major physical enhancements to the infrastructure to include automation of major control and monitoring points such as grade crossings, switches and interlockings.
   b) Quantify improvements in operational efficiency including on-time performance, dwell time and freight and passenger volumes over time.
2. Market-Oriented Reform:
   a) Quantify anticipated freight and passenger service improvements that will support the continued growth and development of Kazakhstan's market economy, particularly the export sector.
3. Human Capacity Building:
   a) Estimate person-days of technical and management training to be provided to what number and category of employees of the Grantee.
4. Technology Transfer and Productivity Enhancement:
   a) Identify opportunities for labor productivity enhancement and quantify by position type.
   b) Identify specific traffic control practices, equipment and systems that will be replaced with more advanced technology.
5. Other – Safety:
   a) Identify major accident and incident types that the new system will reduce or eliminate – to include collisions, derailments and grade-crossing accidents - and project forward the anticipated improvement based on the Grantee's historical safety records.

Task 10 - Final Report

The Contractor shall prepare and provide to the Grantee and to USTDA a Final Report in accordance with Clause I of Annex II of the Grant Agreement. Each of the above tasks in this Terms of Reference must be distinctly set forth in the Final Report in a substantive and comprehensive manner, and the Final Report shall include all corresponding deliverables. The Final Report shall contain an executive summary. In addition to any other required deliverables in accordance with Clause I of Annex II of the Grant Agreement, the Contractor shall provide both the Grantee and USTDA with a Public Version of the Final Report on CD-ROM. The CD-ROM version of the Final Report shall include:

- Adobe Acrobat readable copies of all documents;
- Source files for all drawings in AutoCAD or Visio format, and;
- Source files for all documents in MS Office 2000 or later formats (note: these files may be provided in equivalent readable formats.)

Notes:

(1) **The Contractor is responsible for compliance with U.S. export licensing requirements, if applicable, in the performance of the Terms of Reference.**

(2) **The Contractor and the Grantee shall be careful to ensure that the public version of the Final Report contains no security or confidential information.**

(3) **The Grantee and USTDA shall have an irrevocable, worldwide, royalty-free, non-exclusive right to use and distribute the Final Report and all work product that is developed under these Terms of Reference.**

A N N E X 6

COMPANY INFORMATION

A. Company Profile

Provide the information listed below relative to the Offeror's firm. If the Offeror is proposing to subcontract some of the proposed work to another firm(s), the information below must be provided for each subcontractor.

1. Name of firm and business address (street address only), including telephone and fax numbers:

2. Year established (include predecessor companies and year(s) established, if appropriate).

3. Type of ownership (e.g. public, private or closely held).

4. If private or closely held company, provide list of shareholders and the percentage of their ownership.

5. List of directors and principal officers (President, Chief Executive Officer, Vice-President(s), Secretary and Treasurer; provide full names including first, middle and last). Please place an asterisk (*) next to the names of those principal officers who will be involved in the Feasibility Study.

6. If Offeror is a subsidiary, indicate if Offeror is a wholly-owned or partially-owned subsidiary. Provide the information requested in items 1 through 5 above for the Offeror’s parent(s).

7. Project Manager's name, address, telephone number, e-mail address and fax number .

B. Offeror's Authorized Negotiator

Provide name, title, address, telephone number, e-mail address and fax number of the Offeror's authorized negotiator. The person cited shall be empowered to make binding commitments for the Offeror and its subcontractors, if any.

C. Negotiation Prerequisites

1. Discuss any current or anticipated commitments which may impact the ability of the Offeror or its subcontractors to complete the Feasibility Study as proposed and reflect such impact within the project schedule.

2. Identify any specific information which is needed from the Grantee before commencing contract negotiations.

D. Offeror's Representations

Please provide exceptions and/or explanations in the event that any of the following representations cannot be made:

1. Offeror is a corporation *[insert applicable type of entity if not a corporation]* duly organized, validly existing and in good standing under the laws of the State of _____. The Offeror has all the requisite corporate power and authority to conduct its business as presently conducted, to submit this proposal, and if selected, to execute and deliver a contract to the Grantee for the performance of the Feasibility Study. The Offeror is not debarred, suspended, or to the best of its knowledge or belief, proposed for debarment, or ineligible for the award of contracts by any federal or state governmental agency or authority. The Offeror has included, with this

proposal, a certified copy of its Articles of Incorporation, and a certificate of good standing issued within one month of the date of its proposal by the State of _____.

2. Neither the Offeror nor any of its principal officers have, within the three-year period preceding this RFP, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a federal, state or local government contract or subcontract; violation of federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, tax evasion, violating federal or state criminal tax laws, or receiving stolen property.

3. Neither the Offeror, nor any of its principal officers, is presently indicted for, or otherwise criminally or civilly charged with, commission of any of the offenses enumerated in paragraph 2 above.

4. There are no federal or state tax liens pending against the assets, property or business of the Offeror. The Offeror, has not, within the three-year period preceding this RFP, been notified of any delinquent federal or state taxes in an amount that exceeds $3,000 for which the liability remains unsatisfied. Taxes are considered delinquent if (a) the tax liability has been fully determined, with no pending administrative or judicial appeals; and (b) a taxpayer has failed to pay the tax liability when full payment is due and required.

5. The Offeror has not commenced a voluntary case or other proceeding seeking liquidation, reorganization or other relief with respect to itself or its debts under any bankruptcy, insolvency or other similar law. The Offeror has not had filed against it an involuntary petition under any bankruptcy, insolvency or similar law.

The selected Offeror shall notify the Grantee and USTDA if any of the representations included in its proposal are no longer true and correct at the time of its entry into a contract with the Grantee. USTDA retains the right to request an updated certificate of good standing from the selected Offeror.

Signed: _____
(Authorized Representative)

Print Name: _____

Title: _____

Date: _____