


ISTA Advocate Research & Value Delivery Program

	<h2>Request For Proposal</h2>		
DATE ISSUED September 18, 2017	REQUIRED SUBMITTAL DATE October 16, 2017	DOCUMENT NO. RFP - 0003	PAGE NO. 1 of 6
TITLE Measurement and Multi-Axis Simulation of Unit Load Stability Transportation Hazards: Phase 1			

SCOPE OF THE PROPOSED RESEARCH PROJECT

The International Safe Transit Association (ISTA) on behalf of the members of its Advocate Research & Value Delivery Program (ARVD) seeks proposals for the following research project.

This project aims to collect statistically significant data on the motion and forces in time history format in various orientations to which unit loads are subjected during transport, and translate this data into tools and test methods that allow users to design and optimize their unit load packaging. The ARVD has determined this to be a four (4) phase research project. The specific work sought for this RFP is directly related to **Phase 1** below:

Project Phases:

1. Pilot field data collection and analysis exploration - The objective for this initial phase is to conduct development work where the learnings can be leveraged to revise ISTA's data collection guidelines to include multiple degrees of freedom motions.
2. Pilot laboratory playback and correlation analysis against the pilot field data collected
3. Statistically significant data collection and Data Analysis
4. Test method development (Conducted by ISTA)

PROJECT PURPOSE AND DESCRIPTION

Pressures to lightweight and reduce packaging materials, in addition to smaller unit counts and unit footprints, have created stability challenges in the transportation of palletized packaged-products being transported as a unitized load. A unitized load is defined as one or more products or packaged-products usually on a skid or pallet, but always secured together or restrained for distribution as a single load. Manufacturers are increasingly moving to creative new shipping designs that use shrink-wrapped bundles, retail-ready display cases, blister packs, clam shells and other configurations that may behave differently in distribution than a standard rectangular fiberboard box. Real-world transportation hazards can adversely affect unstable or inadequately secured unitized loads. It has been observed that these hazards often have a strong horizontal or rotational motion component and may include such events as:

- Transport vehicle motions
 - Truck
 - Starting
 - Stopping
 - Turning
 - Pot holes/speed bumps/curbs/rumble strips
 - Hills and road crown

The purpose of this project is to collect useful data on the motions and forces to which unit loads are subjected

during transport. The objective is to provide the Advocate Council and ISTA's Technical Division with meaningful data that can be leveraged to develop tools that allow users to optimize the stability of their unit load packaging in the design stage.

SCOPE OF WORK SOUGHT IN THIS REQUEST FOR PROPOSAL

The scope of work sought in this RFP focuses specifically on trucks moving over the road as studying the hazards created in this environment have been identified by the ISTA load stability workgroup as having the greatest initial return to the project at hand. The specific work sought is as follows:

1. The technically defensible collection¹ of input data from a LTL truck (preferably a lightly loaded leaf spring suspension trailer) that characterizes the vehicle motions (6 degrees of freedom) during the following events: Each of the following staged events should be recorded at least 3 times.
 - a. A "known" vehicle accelerating from a stop to 35 MPH followed by a rapid stop (close to a skidding stop) using proper safety cautions.
 - b. A "known" vehicle traversing a speed bump at three (3) different speeds appropriate for the vehicle. Note the exact dimensions of the speed bump.
 - c. A "known" vehicle backing into a rigid dock equipped with appropriate shock absorbing bumpers at "normal" backup speed, and "elevated" backup speed consistent with the equipment and safety of the personnel.
 - d. A "known" vehicle traversing a standard curb with half of the truck wheels on level pavement and the other half traveling over a curb. Conduct this test at two separate speeds appropriate for the truck, the height of the curb, and safety considerations (suggest five and 10 mph). Repeat this measurement for the opposite set of tires traversing the curb.
 - e. A "Known" vehicles traversing a tight left-handed 360 degree turn at two different speeds appropriate for the truck, the lading, and safety considerations. Repeat this measurement for a right-hand turn.
 - f. A "known" vehicle traversing a pot hole at three (3) different speeds appropriate for the vehicle, the dimensions of the pot hole, and safety of the driver and lading.
 - g. A "known" vehicle traversing a section of rumble strip at three (3) different speeds appropriate for the vehicle, the dimensions of the rumble strip, and safety of the driver and lading.
 - h. A "known" vehicle traversing a steep hill at three (3) different speeds appropriate for the vehicle, the dimensions of the hill, and safety of the driver and lading.
 - i. A "known" vehicle traversing a section of crowned road at three (3) different speeds appropriate for the vehicle, the dimensions of the crowned road, and safety of the driver and lading.

2. The collection¹ of lading²) response data that demonstrates the effects of the above vehicle input motions (6 degrees of freedom).

¹Any proposed recording setup will be considered, but it is preferred that three (3) triaxial linear accelerometers arranged in a triangular configuration with 30 inches between each sensor together with three (3) angular velocity sensors co-located with the triaxial accelerometers, twelve (12) channels total be used to capture multi-axial vibrations and any resultant pallet response.

²Lading used should visually respond to multiple directional inputs. For consistency, a stretch wrapped pallet of 78 bundle packs of 16.9 oz bottles of water should be used. An example of such lading can be found at <https://www.samsclub.com/sams/nestle-pure-life-purified-bottled-water-1-2-liter-16-9-oz-72-case-pallet/prod3160428.ip?xid=plp:product:1:1>. Any variations must be approved by ISTA. It is critical

that the lading is well documented (pallet pattern, stretch wrap force to load, bottle wall thickness, etc) and the same lading is used for phase 1 and 2.

The collection of video footage of the exterior of the vehicle and the internal lading responses during the of the above vehicle input motions (6 degrees of freedom).

Note: It is expected that above work would be executed in a controlled field environment over the course of one or two days.

3. Clearly documented learnings and recommendations for monitoring future multiple degrees of freedom shipping environments.
4. Engagement with ISTA's Technical Board supporting the revision of ISTA's data collection guidelines to include monitoring multiple degrees of freedom motions.

DELIVERABLES

The Scope of Work Sought states requirements for the project, including the services and the tangible work products to be delivered, and the tasks the Advocate Council has identified as necessary to meet those requirements.

The collected data and video recordings will be delivered in raw format with a report specifying:

- Analysis of the raw data to demonstrate how the output supports the overall objective of the project
 - For each of the staged events, the following analysis should be provided.
 - Acceleration vs time plots for all three linear axis
 - Displacement vs. time plots for all three linear axis
 - Angular rate and direction plots for all three rotational axis
 - Rotational velocity and direction vs time plots for all three rotational axis
 - Angular rotation vs time plots for all three rotational axis
- Detailed methodology recommendation for phase 2
- Instrument(s) used and their detailed setup(s)
- Data recorder calibration information
- Mounting and mounting orientation
- Related equipment
- Vehicle and vehicle lading
- Vehicle routes and speeds
- Road conditions
- Any relevant curb dimensions, speed bump dimensions, road crown dimensions, hill characteristics, dock bumper sizes, etc.
- Photographs showing all aspects.

MINIMUM QUALIFICATIONS FOR PRINCIPAL CONSULTANT/S

Prior experience in transportation environment data collection studies is required.

FORM OF THE PROPOSAL

Proposals should be tailored specifically to the project at hand. The Advocate Council reserves the right, however, to modify specific requirements, based on changed circumstances, the proposal selection process, and contract negotiations with the Applicant(s) selected for negotiations, and to do so with or without issuing a revised RFP. The Applicant must provide in its proposal a detailed proposed scope of work showing how it will meet the RFP requirements.

The Applicant's proposal should address each task from the Scope of Work specifically and describe in detail how the Applicant will achieve the objective, or how the Applicant will enable ISTA to achieve the objective. The applicant's proposal should also include details on the expected instrumentation to be used, their anticipated setup, mounting information, format in which raw data will be delivered, and potential analysis techniques. Please provide the following items as part of the proposal for consideration:

The Applicant's proposal should address each task from the Scope of Work specifically and describe in detail how the Applicant will achieve the objective, or how the Applicant will enable ISTA to achieve the objective. The applicant's proposal should also include details on the expected instrumentation to be used, their anticipated setup, mounting information, format in which raw data will be delivered, and potential analysis techniques. Provide one electronic version of the proposal that must also include the following sections:

1. Qualifications:

- A brief description of the proposing firm /research organization/ individual.
- A detailed description of the proposed individuals that would be assigned to this project, including role, title, experience, and education.
- Examples of similar research projects conducted in the past 5 years.
- At least three references, including the names of individual contacts and telephone numbers.
- Any other qualifications deemed necessary to complete the work if contracted by ISTA.

2. Fees:

Give a total cost estimate for time and materials within the scope and timeline you propose including payment terms and schedule. Progress payments can be considered provided the proposal identifies how project progress can be verified. (i.e. upon submission of completed literature search, initial draft, final report, etc.) Preference will be given to fixed price bids.

- The proposal must include proposed costs to complete the tasks described in the project scope as well as identify the cost of any additional data collection recommended.
- List any other fees applicable to the work requested by ISTA.

3. Project Timeline:

A detailed timeline should accompany the project plan.

4. Conflicts Analysis: (If necessary)

Assurance that the firm has conducted an initial conflicts analysis and has not uncovered any potential conflicts.

SUBMISSIONS

All proposals must be received by 5pm, EDT, October 16, 2017. Address proposals to:

A.J. Gruber, President
ISTA
1400 Abbot Road, Suite 160
East Lansing, MI 48823

Or by email to A.J. Gruber, ISTA President at ajgruber@ista.org and Dwight Schmidt, ISTA Advocate Program Manager at dwright@consultschmidt.com

Questions regarding this RFP or your proposal submission may be addressed to Dwight Schmidt at the above email address, or telephone 317-753-1437.

SELECTION PROCESS

The ISTA staff, its Technical Division Board and the Technical Representatives of the ARVD consortium will evaluate all proposals and may conduct telephone conferences to clarify information such as approach, timing and costs.

All proposals will be evaluated based on the following criteria:

- Overall proposal suitability: proposal must meet the purpose, scope and needs included herein and be presented in a clear and organized manner
- Experience: Potential contactors will be evaluated on their experience as it pertains to the scope of this project
- Previous work: Potential contractors will be evaluated on examples of their work pertaining to similar research projects as well as testimonials and references
- Value and cost: Potential contractors will be evaluated on the cost of their proposal based on the work to be performed in accordance with the scope of this project
- Technical expertise and experience
- The ability of the potential contractors to complete the project according to the proposed timeline

Once all proposals have been received and reviewed, the Advocate Council will complete the Phase Gate 2 review of the project evaluation form. This consists of the following topics:

- Aligns with at least one primary use of funds as outlined in Prospectus
- Value/potential impact/benefit to advocates
- Demands of performing project
- Costs and resources
- Project potential
- Risk

If at least one proposal passes Phase Gate 2 review, the project will move forward.

The Advocate Council and ISTA staff shall determine a prioritization as to which regions/channels are to be studied and establishes exactly what needs to be measured and observed in each based upon the costs associated with the quotes received.

Final selection of a project provider will be made by the voting members of the ARVD.

RFP TIMELINE

September 18, 2017 - Release and distribution of RFP

October 2, 2017 - Deadline for vendors to submit written questions and/or non-mandatory notice of intent

October 9, 2017 - Questions with written answers provided to all interested vendors

October 16, 2017 - Deadline for submitting proposals

October 30, 2017 - Finalists notified

November 6, 2017 - Finalist interviews

November 27, 2017 - Vendor selected