

TMHNA UNIVERSITY RESEARCH PROGRAM

OVERVIEW

Toyota Material Handling North America (TMHNA) is making research funding available in the fields of material handling in 2019. TMHNA is promoting independent research through its University Research Program. TMHNA is seeking proposals for research that drives new technology or innovative approaches to the material handling industry.

Selected proposals will receive financial support of up to \$1 million dollars per year. It is anticipated that multiple proposals will receive financial support. Faculty that receive financial support through the University Research Program (URP) may be invited to renew the contract for up to three years based on the research outcomes.

UNIVERSITY RESEARCH PROGRAM RESEARCH THEMES

Proposal themes related to the following areas are encouraged but given the broad nature material handling, other themes are welcome as well.

- Material handling for last mile delivery
- Material handling for urban environments
- Material handling for piece picking
- Material handling for reverse logistics
- Material handling automation
- Remote operation of material handling equipment
- Warehousing Energy Infrastructure
- VR/AR for material handling applications
- Machine learning in material handling
- ADAS systems for material handling equipment
- Industry 4.0

2019-2020 UNIVERSITY RESEARCH PROGRAM TIMELINE

PROPOSAL SUBMISSION OPEN

September 1, 2019

PROPOSAL DEADLINE

December 4, 2019

ANNOUNCEMENT OF SELECTED PROPOSALS

March 2020

Finalists will be contacted by a representative from TMHNA. At that time, a research project liaison will be assigned by TMHNA. The liaison will serve as the point of contact for duration of the project.

CONFIDENTIAL AND PROPRIETARY INFORMATION

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EVALUATION CRITERIA

Through the URP, TMHNA hopes to establish relationships with leading universities and researchers to conduct innovative research that will advance material handling and contribute to TMHNA's future research activities. Funding selection of URP proposals shall be at the sole discretion of TMHNA.

The following criteria are the primary criteria that will be used to evaluate URP proposals:

- Research must contribute to the field of material handling.
- Research must be significant, innovative and have a positive impact on the future of material handling.
- Research effort must be well planned and feasible within the time period specified and budget requested.
- Researchers and principal investigators must be qualified in the proposed field of research.

REQUIRED DOCUMENTS

Each research proposal package shall include the following three documents and shall be delivered electronically to UniversityResearchProgram@TMHNA.com

1. Research proposal package in PDF format.
2. Scanned PDF copy of an unmodified URP Proposal Confirmation Letter signed by an authorized university official.

If submitting a joint proposal with other universities, each university included in the proposal must sign the URP Proposal Confirmation Letter.

UNIVERSITY RESEARCH PROGRAM PROPOSAL FORMAT

Applicants are expected to provide the following information with each URP proposal. It is recommended that the research proposal (item 3 below) be limited to 10 pages. Items 1, 2, 4 & 5 are not included in the 10 page count.

1. TMHNA URP proposal cover page including the proposal title, the name and university affiliation of the principal investigator along with any co-PIs.
2. One page executive abstract with key words. If applicable, the abstract should indicate if the proposal could be a multi-year effort. The project description, however, should focus on year one objectives.
3. A research proposal (up to 10 pages) that:
 - a. Clearly states the research opportunity and objectives.
 - b. Explains why the research is innovative.
 - c. Proposes the anticipated significance of the research.
 - d. Provides a research plan and technical approach.
 - e. Identifies milestones that measure the success of the project.
 - f. Defines the expected outcomes.
 - g. Does not contain confidential or proprietary information.
4. Detailed budget in US dollars that clearly identifies the funding requested.
5. Additional supporting materials such as curricula vitae of principal investigators and other researchers is to be included in the appendix.

If you intend to submit a multi-year proposal, please indicate this in item 2. The budget (item 4 above) shall be completed on a one year proposal basis only. In order to receive funding for subsequent years, applicants must reapply with an updated proposal.

ABOUT THE SPONSORS

Toyota Material Handling North America (TMHNA), the industry leader in forklift sales, is composed of three main group companies: Toyota Material Handling U.S.A., Inc.; Toyota Industrial Equipment Mfg., Inc.; and The Raymond Corporation. One in three forklifts sold in North America is either a Toyota or Raymond product. With more than 2 million square feet of manufacturing space, TMHNA is composed of four manufacturing plant locations: Columbus, Indiana; Greene, New York; Muscatine, Iowa; and Oakville, Ontario, Canada, that produce racking products and more than 1,500 forklifts per week. With an annual revenue of over \$3 billion, TMHNA has more than 10,000 people, 3 million service parts available and more than 300 dealer locations to support Toyota and Raymond customers throughout North America.