

Cooperative Agreement between

Utah Transit Authority (UTA),

The University of Utah (University),

and

AutoFill Technologies B.V. (AutoFill)

This cooperative agreement between the University of Utah, a body politic and corporate of the State of Utah, AutoFill, and UTA (hereinafter “Parties”) is intended to describe the roles and responsibilities of the Parties with regard to the Polarized Infrared and Optical Imaging System for Transit Infrastructure Condition Assessment (hereinafter “Project”).

The Parties hereby agree as follows:

1. Project Description: The project team proposes to develop and demonstrate a system that can identify, quantify, and monitor both the internal and external defects of rail track and tie structures with the potential for high-speed full track section inspection. The system employs a polarized infrared camera and a polarized optical camera, whose data collection will be immune from adverse infrared or optical illumination conditions in a field environment. An envisioned fully developed system can be mounted on an inspection vehicle or revenue service train and provide early warning and long-term monitoring of track and tie conditions. The proposed work plan is composed of three tasks: technology development, demonstration, and evaluation. The work plan allows a rapid technology demonstration starting at the tenth project month and contains over nine months of data collection and evaluation effort. It is the intent of the partners that the research will lead to a developed product that will eventually be applied as a commercial product with the goal of deployment at scale.

The mission of this project is to serve the transit industry by increasing safety, improving infrastructure reliability, and minimizing the risks of accidents induced by rail defects and tie degradation. The proposal team will investigate the polarized infrared and optical imaging technology as tools for transit asset assessment by (i) developing a robust passive infrared thermography for rail track and tie inspection, covering variations in defect types, sizes, temperature, and weather conditions; and (ii) developing a robust optical imaging solution, along with machine learning algorithms, that can detect and classify rail and tie external defects, such as rail surface condition and missing rail fasteners. Upon its success, the proposed research will open up a new avenue for high-speed real-time full track section inspection.

2. Each Party will use reasonable efforts consistent with their mission to effectuate the purpose of the grant as described in Exhibit 1 to this Agreement.

3. Each party agrees that as a recipient or sub-recipient of an FTA grant, it will abide by the terms and conditions contained in the FTA-UTA Master Agreement attached as Exhibit 2 to this Agreement.

4. Each Party shall use their reasonable efforts consistent with their mission to perform its responsibilities and obligations as described below:

1. UTA Responsibilities & Obligations.

a. Technical and Management Contribution. UTA will manage the grant application, award, and implementation processes. UTA's operations and maintenance teams will also coordinate with the other Parties to ensure the imaging hardware can be installed on revenue vehicles and tested in real situations. Data from UTA's regular inspections will also be provided to the University of Utah and AutoFill to compare with data collected during this demonstration.

b. Financial Match Contribution. Zero

2. University Responsibilities & Obligations.

a. Technical Contribution. The University of Utah group will be responsible for polarized infrared thermography system development, data collection, system demonstration, and technology evaluation. The University of Utah group has unique experience and capability in polarized infrared thermography, rail defect detection, and understanding the complex field environment for rail and transit industry. The Infrastructure Sensing and Experimental Mechanics (iSEM) lab at the University of Utah will develop the proposed polarized infrared thermography, data acquisition system, and algorithms. And the iSEM lab shall address questions such as the ones that are posed in this project proposal. The lab houses commercial IR cameras AVIO R450 Pro with an ultra-high sensitivity of 25 mK. The research team's highly qualified student research assistants will work on the project as part of their compensation. Their involvement will also contribute to the development of future rail and transit workforce in the U.S.

b. Financial Contribution. The University will contribute \$43,039 cost share support to this project. Detailed information on the cost sharing can be found in Exhibit 1.

3. AutoFill Responsibilities & Obligations.

a. Technical Contribution: AutoFill will lead the development of the polarized optical imaging system. AutoFill is specialized in damage detection using polarized imaging technology. The team members have previously worked in several large automated



AutoFill Technologies B.V. Reimbursement Request								
Activity Line Item	Budgeted		Current Expenditures		Expenditures to Date		Remaining	
	Federal	Local (In Kind)	Federal	Local (In Kind)	Federal (In Kind)	Local (In Kind)	Federal	Local (In Kind)
Managerial, Technical, & Professional (Personnel)	\$ 103,551	\$ 34,458						
Travel	\$ 7,914	\$ 2,634						
Fringe Benefits	\$ 28,630	\$ 9,527						
Supplies	\$ 25,905	\$ 8,619						
<b>Total</b>	<b>\$ 166,000</b>	<b>\$ 55,238</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>

5. Quarterly Progress Updates. Each Party agrees to participate in quarterly progress and status meetings and/or reports as scheduled by UTA. Each Party shall provide a full and transparent accounting of its efforts under this Agreement as well as its plans moving forward.
6. Duration and Termination. The duration of this Agreement shall be 18 months from the Effective Date. Any Party may terminate its participation in the Agreement at any time with 60 days advance notice. If termination occurs from any Party, UTA shall reimburse the other Parties for all activities carried out until the date of termination and all non-cancellable fees and costs incurred up to the date of termination. UTA's reimbursement obligation under this paragraph shall not exceed the amount of federal grant funds received. The Parties will be liable for their promised cost match in proportion with its receipt and expenditure of federal grant funds as of the date of Termination, as well as any repayment of unearned federal funds required by FTA.
7. Railway Training. Any employee, agent or representative of the University or AutoFill who performs work under this Agreement in proximity to a UTA rail line must complete UTA's Roadway Workers Protection (RWP).
8. General Provisions
  - a. MUTUAL INDEMNITY
    - i. Each Party to the fullest extent permitted by law, shall indemnify, hold harmless and defend the other Party's officers, directors, and employees from and against claims, losses, damages, liabilities, resulting from its negligent acts or omissions.
    - ii. The University of Utah is a governmental entity under the Governmental Immunity Act of Utah, Utah Code §§ 63G -7-101 to 904, as amended (the "Act"). Nothing in the Agreement shall be construed as a waiver by the University of Utah of any protections, rights, or defenses applicable to the University of Utah under the Act, including without limitation, the provisions of section 63G-7-604 regarding limitation of judgments. It is not the intent of the University of Utah to incur by contract any liability for the operations, acts, or omissions of the other Parties or any third party and nothing in the Agreement shall be so interpreted or construed. Without limiting the generality of the foregoing, and notwithstanding any provisions to the contrary in the Agreement, or the application of any law other than the laws of the State of Utah to this Agreement any indemnity obligations of the University of Utah contained in the Agreement are subject to the Act, are limited to the amounts

established in section 63G-7-604 of the Act, and are further limited only to claims that arise from the negligent acts or omissions of the University of Utah.

- b. OWNERSHIP OF DESIGNS, DRAWINGS, AND WORK PRODUCT Any intellectual property prepared or developed pursuant to this Agreement including without limitation drawings, specifications, manuals, calculations, maps, sketches, designs, tracings, notes, reports, data, computer programs, models and samples (“Foreground IP”), shall remain the property of the Party or Parties who developed the IP. For the avoidance of doubt, all three parties (UTA, Autofill, and U of U) to this cooperative research and development agreement shall be considered as developers and owners of any IP developed within the scope and funding of this agreement by any of the three parties.
- c. FORCE MAJEURE No party to the Contract will be held responsible for delay or default caused by fire, riot, acts of God and/or war which are beyond that party's reasonable control. UTA may terminate the Contract after determining such delay or default will reasonably prevent successful performance of the Contract.
- d. DISPUTES Disputes arising under this Agreement shall be resolved by discussion at successive levels of management culminating with the respective Chief Executive Officers or Executive Directors. If resolution doesn't occur through good faith discussion at the Executive Director level, the Parties shall submit the matter to the mediation under the auspices of JAMS dispute resolution services. Each Party to this Agreement will be responsible for its own costs and expense related to the mediation process.
- e. WAIVER Failure of any Party at any time to require performance of any provision of this Agreement shall not limit the other Parties' rights to enforce the provision. Waiver of any breach of any provision shall not be a waiver of any succeeding breach of the provision of a waiver of the provision itself or any other provision.
- f. GOVERING LAW The Agreement and all Contract Documents are governed by the laws of the State of Utah, without giving effect to its conflict of law principles. Actions to enforce the terms of this Agreement may only be brought in the Third District Court for Salt Lake County, Utah.
- g. ENTIRE AGREEMENT This Agreement supersedes and replaces all written and oral agreements previously made or existing between the Agencies regarding the subject matter hereof. Any amendment to this Agreement must be in writing and executed by an authorized representative of each Party.
- h. PUBLICATION The University of Utah and its personnel shall have the right, consistent with academic standards and subject to this Section, to publish in scientific or other journals, or to present at professional or academic conferences or other meetings, data and results created by the University of Utah under this Agreement. Sixty (60) days prior to submission of any material for publication or presentation, the University of Utah shall provide UTA with such material for its review. No publication or presentation shall be made unless and until any confidential

information provided to the University of Utah by UTA has been removed, unless otherwise approved in writing by UTA. If requested in writing by UTA, the University of Utah shall withhold, or shall cause its personnel to withhold, material from submission for publication or presentation for an additional Sixty (60) days from the date of UTA's request to allow for the filing of a patent application or the taking of such measures as UTA deems appropriate to establish and preserve its proprietary rights in the information or material being submitted for publication or presentation. If the University of Utah does not receive UTA's written response to the proposed publication within the sixty (60) day period, then UTA shall be deemed to have consented to such submission or public disclosure of the proposed publication delivered to UTA.

- i. CONFIDENTIALITY UTA and the University of Utah is subject to the Utah Government Records Access and Management Act, Section 63G-2-101, et. seq., Utah Code Ann. ("GRAMA"), as amended; Under GRAMA, certain records in connection with this Agreement may be subject to public disclosure; the Parties acknowledge that UTA and the University of Utah's confidentiality obligations under this Agreement shall be subject in all respects to compliance with GRAMA.
- j. EXPORT CONTROL In the event that a party under this Agreement intends to provide information, equipment or materials restricted under applicable export control law or regulations (including but not limited to Export Administration Regulations and International Traffic in Arms Regulations, to the other party during the course of any activity under this Agreement, the disclosing party must first notify the receiving party of its intention to provide this data at least 30 days in advance of actually providing this information, equipment or materials, and indicate to whom at receiving party the information, equipment or materials is being provided, along with specific reference to the applicable regulatory sections. Receiving party will then determine whether it will accept such information, equipment or materials or decline. In addition, each party's performance of any activity under this Agreement is subject to compliance with all U.S. export control and Office of Foreign Assets Controls (OFAC) regulations.
- k. INSURANCE The Parties to this Agreement shall either self-insure or maintain insurance coverage sufficient to meet their obligations hereunder and consistent with applicable law.
- l. USE OF NAME No Party may not use the name of any of the other Parties in any news release or advertising or any publications directed to the general public without written approval of the other Party.

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed as of the last date written below.

UTAH TRANSIT AUTHORITY

UNIVERSITY OF UTAH

\_\_\_\_\_  
Title: Executive Director

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

\_\_\_\_\_  
Title: Sponsored Projects Officer

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

\_\_\_\_\_  
Title: Chief Service Development Officer

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

AATF:  
DocuSigned by:

*Mike Bell* \_\_\_\_\_

70E33A415BA44F6...

Title: Utah Office of Attorney General

Date: 9/12/2022  
\_\_\_\_\_

AUTOFILL TECHNOLOGIES B.V.

\_\_\_\_\_  
Title: CEO & Co-Founder

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

EXHIBIT 1 – FTA GRANT

Real-Time Transit Infrastructure and Rolling Stock Condition Assessment Demonstration Program

EXHIBIT 2 – MASTER AGREEMENT TERMS AND CONDITIONS