AMENDMENT 1

This First Amendment ("**Amendment 1**") is made and entered into effective this 8 day of April 2021 ("**Effective Date**"), by and between RISE Coastal Community Resilience, Inc. D/B/A RISE a Virginia nonstock 501(c)(3) corporation, located at 500 East Main Street, Norfolk, Virginia 23510 ("**RISE**") and CODESTREAM SOLUTIONS PTY. LTD, D/B/A Floodmapp ("**Floodmapp**") and amends Exhibit A of the Award Agreement dated February 1, 2021 ("**Agreement**").

RECITALS

A.   Floodmapp and RISE entered into the Agreement on February 1, 2021 to develop a detailed implementation and evaluation program plan for the program as part of Phase 1 – Program Planning, Task 1.

B.   Based on the Phase 1 deliverable, the Parties now desire to execute Phase 2 – Development of the program, which includes Tasks 2 – 7.

Accordingly, the Parties agree as follows:

Exhibit A – Amended Statement of Work and Budget

As a winner of the Urban Mobility Resilience Challenge, Floodmapp ("Awardee") will implement and run a demonstration pilot ("Program") that will provide a real-time feed of pluvial and fluvial flooding threats and flood-caused road closure reports to traffic guidance applications. As part of the Program, Awardee will execute an evaluation of the real-time version of their system which, if proven effective, will be made accessible to the public in Hampton Roads, Virginia.

RISE will work with Awardee to establish a System Assessment Committee (SAC) consisting of people with knowledge of (but not limited to) city operations, traffic flow, and flooding. The SAC will be the responsible party for assessing the Awardee's system and proposing a public evaluation.

The Award received shall not be used for development of software applications and are not intended by RISE to be for the purchase of property or services from the Awardee. RISE will award funds to the Awardee for the outputs achieved by their software applications and to set up and execute an evaluation program. RISE does not intend, by virtue of funding distributed to the Awardee to acquire rights in or to the software applications developed by the Awardee. Subject to the applicability of the provisions of 37 CFR Part 401, 2 CFR 200 and the National Disaster Resilience Competition Grant Agreement (#16-NDR-02), RISE shall obtain no right,

title, or interest in or to the software applications developed by the Awardee.

Period of Performance for Stage 1: February 1, 2021-February 28, 2022

PHASE 1 - PROGRAM PLANNING

Tasks

Task 1: Detailed Implementation and Evaluation Program Planning

In Phase 1, the Awardee will develop a detailed implementation and evaluation plan for the Program. The plan will address, but is not limited to, the following:

1. Establishing a real-time feed of Incident and Road Closure reports for Waze (and other applications as available) through the cities' Connected Communities Program (CCP), including delivery of the reports in real-time to appropriate personnel/servers, etc. The Winner will be responsible to maintain this feed, its operation, and for addressing any errors, malfunctions, and outages that may occur. This performance will be part of the overall assessment.
2. Establishing the ability to view incidents and closures in real-time. The SAC will assess the performance in operation during good weather and during rain/tidal flooding events.
3. Real-life verification of flooding reports and closures by being on site and documenting the flooding effects.
4. In conjunction with the SAC, develop a plan for the real-time evaluation consisting of:
    a. Developing a phased roll out of real-time public version
    b. Establishing protocols for a real-time public evaluation
    c. PR to get public awareness of the evaluation
    d. Developing a website for feedback from SAC, the public and other users of the real-time system
    e. Making the real-time system live and support it for the duration of the evaluation
    f. Consolidating feedback and sharing with SAC.
5. Marketing.

Completion Timeline:
- By March 31, 2021

Deliverable:
- A detailed Implementation and Evaluation Program Plan

PHASE 2 – RAINFALL DATA IDENTIFICATION, VALIDATION, AND INTEGRATION

In Phase 2, Floodmapp will source, test, and validate rainfall data in the Hampton Roads region that can be integrated with WAZE. Phase 2 includes Tasks 2 – 7. In order to issue a Notice to Proceed for Phase 3 – Product Launch and Evaluation, at the end of Phase 2 RISE and Floodmapp must agree that there is a viable rainfall model with a level of accuracy appropriate for integration with Floodmapp's existing model, integration with WAZE and public launch.

All Tasks will be accompanied by a Monthly Report due on the 15th of each month (if not already provided in a milestone deliverable) and invoices are be submitted on the 1st and 15th of each month to include supporting documentation, invoices, and timesheets.

Floodmapp also commits to participating in at least one RISE event each quarter during the period of performance.

Task 2: SAC Established, Stakeholder Identified

This task includes establishing and finalizing the members of the SAC and identifying key stakeholders. Creating a schedule of events and solidifying meeting times and dates for the SAC.

Task 2 Deliverable
- A list of key events in the year that have been identified
- Report: Outlining the SAC, stakeholders, responsibilities

Task 2 Completion Timeline
- May 30, 2021

Task 3: Dataset Cost Evaluation

Evaluate available databases where rainfall data can be accessed. Identify costs of each potential dataset, technical requirements, and limitations.

Task 3 Deliverable
- Memo summarizing available datasets. Comparative analysis to determine best fit and budget. Recommended option with rationale for decision.

Task 3 Completion Timeline
- April 30, 2021

Task 4: Pluvial Data Purchase

Floodmapp will obtain quotes, complete small purchase form, execute contract and pay company to acquire pluvial flooding data.

Task 4 Deliverable

- Provide executed contract with data company and a small purchase form documenting procurement (including sam.gov verification for contracts over $25,000)
- Invoice from data company and proof of payment

Task 4 Completion Timeline
- April 30, 2021

Task 5: Pluvial Modeling Approach

Identify and document pluvial model methodologies including accuracy, run time and feasibility and integration in the Hampton Roads region. Technical evaluation and comparative assessment of options for pluvial model approach and implementation to include opportunities, limitations, risks, and complexities.

Task 5 Deliverable
Report: Technical summary of Pluvial Flood Model Approach, including the methodology, risks, limitations & uncertainties with the pluvial approach.

Task 5 Completion Timeline
- May 31, 2021

Task 6: Pluvial Model Testing, Calibration & Validation

Integrate data to a pluvial model, simulation testing, calibration, and validation against historic events. Receive approval from the SAC for pluvial model test performance and integration.

Task 6 Deliverable
- Report: Technical Report Summarizing Model performance

Task 6 Completion Timeline
- August 31, 2021

Task 7: Pluvial Integration

Integrate pluvial model to Nowcast Road safe System. Live pluvial model testing and final pluvial model assessment. SAC endorsement for Pluvial model live performance and approval for operation.

Task 7 Deliverable
- Report: Pluvial Integration & Testing Report

Task 7 Completion Timeline
- July 31, 2021

Task 8: Provide Access to ESRI Dashboard & Floodmapp Nowcast Established

Onboard SAC members to ArcGIS Map, and data collection tool. Establish the ability to view incidents and closures in real time, setup SAC/Public feedback mechanism. Develop plan for real time flood evaluation and explore additional mapping platforms to be used.

Task 8 Deliverable
- Report: Outlining the ESRI URL, user credentials, etc. & describing Nowcast with any System Improvements

Task 8 Completion Timeline
- May 31, 2021

Milestone: In order to issue a Notice to Proceed for Phase 3 – Product Launch and Evaluation, at the end of Phase 2 RISE and Floodmapp must agree that there is a viable and accurate pluvial model appropriate for public launch and integration with WAZE.

PHASE 3 – PRODUCT LAUNCH AND EVALUATION

Task 9: Pre-Launch Community Outreach
Perform community engagement and outreach in the Hampton Roads region to alert citizens of the upcoming WAZE app to include rainfall data available for download. Local PR firm to promote WAZE integration and upcoming launch in the region.

Task 9 Deliverable
- Marketing Brochure & media release prepared.

Task 9 Completion Timeline
- June 30, 2021

Task 10: Waze Integration
Complete WAZE integration and ensure timely delivery of reports to appropriate personnel and servers. Test WAZE feed functions, and complete system reliability improvements.

Task 10 Deliverable
- Report: Outlining Waze Integration

Task 10 Completion Timeline
- August 31, 2021

Task 11: Public Release
Perform PR in Hampton Roads to announce initial public launch of the Road Dashboard/Waze. Prepare release to the public, and release WAZE with Floodmapp nowcast capabilities. The campaign will encourage residents and stakeholders to download the WAZE app if hey haven't already, to access live

traffic routing through the wet season. The campaign will also include information sessions.

Task 11 Deliverable
- Press Release: How to Download WAZE

Task 11 Completion Timeline
- August 31, 2021

Task 12: Validation and Verification

Create platform to collect community feedback on system performance and develop website for SAC feedback. Obtain real life flooding reports for the site and ensure the real time system is live and provide support during evaluation period. Gather and consolidate the feedback for presentation to the SAC.

Task 12 Deliverable
- Report: Document Findings from Validation & Verification Process

Task 12 Completion Timeline
- November 30, 2021

Task 13: Product Marketing

Prepare demo decks for Nowcast Road safe, initiate product marketing meetings and complete follow up.

Task 13 Deliverable
- Report: Sample demo deck and sales leads

Task 13 Completion Timeline
- December 31, 2021

Task 14: Final Evaluation

Launch live pilot collaboration with WAZE in the Hampton Roads area for a duration of 12 months while providing ongoing validation and verification. Gather the data from the evaluation period, consolidate the feedback and present to the SAC. Develop additional marketing materials to demonstrate product performance based on historical events to provide our sales leads with proof of model validation and technical feasibility in new areas.

Task 14 Deliverable
- Report: Final Evaluation submitted to SAC

Task 14 Completion Timeline
- January 31, 2022

Task 15: SAC Final Feedback

Receive and process feedback from the SAC on performance of real time system. Consolidate final feedback from system and share with the SAC. Standard system maintenance and review of real time system.

Task 15 Deliverable
- Report: SAC Final Feedback on Project and Floodmapp

Task 15 Completion Timeline
- February 28, 2022

Budget/Sources and Uses of Funds

TASK	DESCRIPTION	RIF Grant
	Task 1 Project Planning Phase	
1.1	Project management	$ 218.62
1.2	Define and agree on members of SAC	$ -
1.3	Map out project methodology and scope in consultation with RISE and SAC. Define project tasks	$ 1,894.74
1.4	Define and agree on project milestones with RISE	$ 72.87
1.5	Define and agree on project deliverables with RISE	$ 72.87
1.6	Develop project cost estimate based on hours, rates and expenses	$ 655.87
1.7	Document & compile project Inception report to summarise above	$ 1,165.99
	Deliverable Milestone Project Plan Report	
	Task 1 Subtotals	**$ 4,080.97**
	Task 2 SAC Established, Stakeholders Indentified	
2.1	Project management	$ 291.50
2.2	Establish SAC	$ 1,603.24
2.3	Identify key stakeholders	$ 218.62
2.4	Establish contact with all stakeholders via adequate communication channel	$ 364.37
2.5	Schedule agreed date/time to meet	$ 145.75
2.6	Define responsibilities for each stakeholder	$ 583.00
2.7	Identify key events in the year to assist with validation activities	$ 291.50
	Deliverable Milestone Report: Outlining the SAC, Stakeholders, responsibilites	
	Task 2 Subtotals	**$ 3,497.98**
	Task 3 Dataset Cost Evaluation	
3.1	Evaluate rainfall and other datasets available	$ 291.50
3.2	Identify and document technical specifications and limitations.	
3.3	Summary table of costs per dataset	
3.4	Comparitive analysis to determine best option to fit technical requirements and budget	$ 368.42
	Deliverable Milestone Memo summarizing available datasets, comparitive	
	Task 3 Subtotals	**$ 659.92**
	Task 4 Pluvial Data Purchase	
4.1	Obtain quote for data purchase. Review and sign contract.	$ 218.62
4.2	Obtain invoice for data purchase	$ 50,036.44
	Deliverable Milestone Report: Invoice & Proof of Payment	
	Task 4 Subtotals	**$ 50,255.06**
	Task 5 Pluvial Modeling Aproach	
5.1	Project management	$ 655.87
5.2	SAC Consultation	$ 659.92
5.3	Identify options for pluvial model approach	$ 1,129.55
5.4	Document pluvial methodologies including accuracy, run time and feasibility for integration	
5.5	Technical evaluation and comparitive assessment of options for pluvial model approach (opportunities, limitations, risks and complexities)	
5.6	Recommend best option based on technical evaluation	
5.7	SAC endorsement for selected methdology	$ 218.62
	Deliverable Milestone Technical Summary of Pluvial Flooding Model Approach	
	Task 5 Subtotals	**$ 2,663.97**

	Task 6 Pluvial Model Testing, Calibration & Validation		
6.1	Project management	$	1,093.12
6.2	SAC Consultation	$	1,214.57
6.3	Rainfall data pipelines, collection and aggregation (including ECMWF)	$	3,103.24
6.4	Data Integration to Pluvial model	$	1,846.15
6.5	Pluvial model simulation testing	$	2,218.62
6.6	Pluvial model experimentation and comparison	$	1,878.54
6.7	Pluvial model calibration and validation against historic events	$	6,785.43
6.8	AWS Cloud Hosting	$	-
6.9	SAC endorsement for Pluvial model test performance and approval for integration	$	3,000.00
	Deliverable Milestone Technical Report Summarizing Model Perframnce		
	Task 6 Subtotals	**$**	**21,139.68**
	Task 7 Pluvial Integration		
7.1	Project management	$	801.62
7.2	Pluvial model integration to Nowcast Roadsafe system (join rasters via geoserver)	$	12,736.84
7.3	Pluvial model live Testing	$	874.49
7.4	Final pluvial model assessment	$	6,157.89
7.5	AWS Cloud Hosting	$	-
7.6	SAC endorsement for Pluvial model live performance and approval for integration	$	3,000.00
	Deliverable Milestone Pluvial Integration & testing report		
	Task 7 Subtotals	**$**	**23,570.85**
	Task 8 Provide Access to ESRI Dashboard & FloodMapp Nowcast Established		
8.1	Project management & Stakeholder Engagement	$	1,165.99
8.2	Create FloodMapp <> RISE ArcGIS Online Map	$	923.08
8.3	Restart FloodMapp Nowcast System	$	2,121.46
8.4	Establish the ability to view incidents and closures in real time	$	728.74
8.5	Create an ArcGIS Online portal to view Road closure results	$	3,421.05
8.6	Onboard SAC Members to ArcGIS Map	$	583.00
8.7	Update Sytem to Add Road Closure/Hazard Layer to Current Map	$	388.66
8.8	Set up SAC / Public Feedback Mechanism (Google form &/ Web portal)	$	2,396.76
8.9	Onboard SAC Members to Data Collection Tool		
8.1	In conjunction with SAC, develop plan for real-time flood evaluation	$	728.74
8.11	Explore Additional mapping platform to be used	$	291.50
8.12	AWS Cloud Hosting	$	3,000.00
	Deliverable Milestone Report: Outlining the ESRI URL, user credentials, etc. & Describing Nowcast with any System Improvements		
	Task 8 Subtotals	**$**	**15,748.99**
	Task 9 Pre-Launch Community Outreach		
9.1	Project management & Stakeholder Engagement	$	1,165.99
9.2	Prepare visual content based on flood scenarios	$	5,052.63
9.3	Prepare writen case studies to demonstrate product performance based on historical events to provide our sales leads with proof of model validation and technical feasibility in new areas.	$	5,429.15
9.4	Perform marketing in Hampton Roads	$	6,000.00
9.5	Local PR firm to promoze Waze integration and public launch	$	8,000.00
	Deliverable Milestone Marketing Brocure & Media Release Prepared		
	Task 9 Subtotals	**$**	**25,647.77**
	Task 10 Waze Integration		
10.1	Project management & Stakeholder Engagement	$	1,165.99
10.2	Nowcast system improvements (ie improved DEM resolution)	$	6,319.84
10.3	Test that Waze feed functions as intended	$	2,267.21
10.4	Ensure delivery of reports in real time to appropriate personnel/servers	$	2,461.54
10.5	Consult with SAC - willingness to Add FM to CCP portal	$	3,724.70
10.6	Geo-code existing Roads dataset after joining CCP	$	2,267.21
10.7	Integrate via Waze or CCP	$	3,400.81
10.8	System reliability improvements	$	7,206.48
10.9	AWS Cloud Hosting	$	3,000.00
	Deliverable Milestone Outlining Waze integrstion		

	Task 10 Subtotals	$	31,813.77
	Task 11 Public Release		
11.1	Project management & Stakeholder Engagement	$	1,384.62
11.2	Perform PR in HR - announce inital public launch of the Road Dashboard / Waze	$	8,874.49
11.3	Release Waze with FloodMapp nowcast capability	$	1,457.49
11.4	Prepare information for release to public	$	1,457.49
11.5	Stakeholder engagement and information sessions	$	1,457.49
	Deliverable Milestone Press Release how to download Waze		
	Task 11 Subtotals	$	14,631.58
	Task 12 Validation and Verifiction		
12.1	• Project management & Stakeholder Engagement	$	1,384.62
12.2	• Create portal/form to collect community feedback on system performance	$	1,384.62
12.3	• Historical data for validation and verification	$	3,449.39
12.4	• Obtain real life flooding reports on site	$	6,036.44
12.5	• Develop webform for feedback from SAC, the public and other users of the real-time system	$	1,214.57
12.6	• Make the real time system live and support it for the duration of the evaluation period	$	3,868.42
12.7	• Consolidate feedback and share with SAC	$	-
	Deliverable Milestone Report: Documenting findings from validation & verification process		
	Task 12 Subtotals	$	17,338.06
	Task 13 Product Marketing		
13.1	• Project management & Stakeholder Engagement	$	1,384.62
13.2	• Prepare sales demo decks for Nowcast Roadsafe	$	7,748.99
13.3	• Book sales demo meetings	$	8,526.32
13.4	• Sales demo meetings & follow-up	$	6,704.45
	Deliverable Milestone Report: BD Sales lead		
	Task 13 Subtotals	$	24,364.37
	Task 14 Final Evalutation		
14.1	• Project management & Stakeholder Engagement	$	1,384.62
14.2	• Create portal/form to collect community feedback on system performance	$	4,753.04
14.3	• Historical data for validation and verification	$	13,538.46
14.4	• Obtain real life flooding reports on site	$	11,449.39
14.5	• Develop webform for feedback from SAC, the public and other users of the real-time system	$	728.74
14.6	• Make the real time system live and support it for the duration of the evaluation period	$	2,538.46
14.7	• Consolidate feedback and share with SAC	$	3,000.00
	Deliverable Milestone Report: Final Evaluation submitted to SAC		
	Task 14 Subtotals	$	37,392.71
	Task 15 SAC Final Feedback		
15.1	• Project management & Stakeholder Engagement	$	1,384.62
15.2	• Receive adequate feedback from SAC and proceed accordingly	$	5,012.15
15.3	• Standard system maintenance	$	7,829.96
15.4	• Review performance of the real-time system	$	6,862.35
15.5	• Consolidate feedback and share with SAC	$	6,105.26
15.6	• AWS Cloud Hosting	$	-
	Deliverable Milestone Report: SAC final feedback on project and FloodMapp		
	Task 15 Subtotals	$	27,194.33
	TOTAL	$	300,000.00

Awardee   **Coastal Community Resilience, Inc., DBA RISE**

By: _____   By: _____

Name:___Juliette Murphy___   Name: Paul A. Robinson, Ph.D.

Title: _____CEO_____   Title: Executive Director, RISE

Date: ___8 April 2021_____   Date: __April 8th, 2021___