



**vineland**  
RESEARCH & INNOVATION CENTRE

# **Automated Cucumber Harvesting**

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**Request for Proposals: Pipe Rail Cart  
Subsystem**

**Addendum #3**

**January 18, 2021**

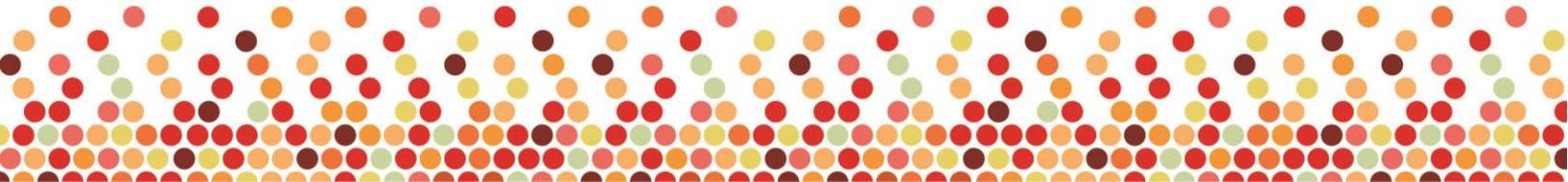
**Vineland Research and Innovation Centre**



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## **1.0 Introduction**

This addendum document provides updated information to the original document *Request for Proposals: Pipe Rail Cart Subsystem* and where applicable and denoted, supersedes it. Responses to all inquiries will be provided via addendum format.

## **2.0 Inquiries and Responses**

### **2.1 When the cart is not on the rail, does it need to be automatically driven? Or manually driven using casters?**

On-rail automation is required. Any off-rail automation can be added as an optional effort.

### **2.2 Do you have a computer with ROS installed and configured already?**

A laptop is currently running Ubuntu and ROS for the system. Cart controller shall interface with it.

### **2.3 Will the end effector strictly be a purchased component or can it be part of the winning bidder's scope to design and build?**

End Effector design is not in scope and being developed by Vineland.

### **2.4 Does the platform have to move up and down?**

The platform does not have to move up and down, but should accommodate for low hanging cucumbers.

### **2.5 Can you confirm the final submission Date?**

January 27, 2021.

### **2.6 Can you please confirm if it doesn't need to carry a person?**

The cart does not need to carry a person.

### **2.7 How open would you be with Line guidance? Could easily hop between rails without complex autonomy.**

Open to the idea of line or inductive guidance systems and can be included in the proposal as an optional item.

### **2.8 Could you quickly go over your current platform, you mentioned you have some computer vision & wheel odom.**

AGV, manipulator, RGB-D navigation cameras, fisheye tracking cameras, cucumber Vision system, LiDARs, onboard computer.

### **2.9 What is the floor condition between the rails within the rows? Is it firm enough to drive on and use the rails as a guide?**

Is generally a plastic barrier covered in leaves and dirt with various support structures for the rails; it is recommended that the cart be conveyed on the rail system. The concrete outside of the rows is generally flat and clean.

### **2.10 How is the environment? What are the conditions? Condensation?**

Tends to be fairly humid and as high as 90% RH in some extreme cases. Ingress protection should be focused on airborne moisture and water droplets rather than focused sprays or jets. Dust is not an issue. Temperature fluctuations within the greenhouse do not pose a condensation risk for equipment that remains within.

### **2.11 With respect to section 4.1, would proprietary software fall under this? Could you clarify?**

All rights to custom work expressly produced for the project must be transferred. Applications of existing proprietary software solutions are exempt.

## **3.0 Supplementary Information**

### **3.1 Basic Requirements:**

- Open Loop Control
- Rudimentary Rail Localization
- Bi-Directional Communication (with ROS controller)

### **3.1 Feature Menu:**

- List any additional functionality and features with associated costs for labour and goods.
- Examples include:
  - Hazzard Cameras
  - 2D/3D Range finger
  - Autonomy Between Rails
  - Advanced Localization