V5 SYSTEMS

Outdoor Portable Power, Computing and Security Independent of the Power Grid

Technology Partners

DELLEMC (intel) **vm**ware

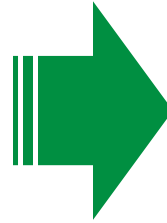**ARROW** **AXIS** COMMUNICATIONS

V5 Systems - Driving IIoT Innovation

Bringing Self-Powered Industrial IoT Computing & Security Solutions To The Outdoors, Wirelessly And At The Edge

V5 Systems Industry Validation

Sell With Confidence!

DELL 2016 **Platinum Winner** "Connect What Matters" IoT Contest	**SIA NEW PRODUCT SHOWCASE WINNER** Video Surveillance Hardware and Accessories V5 Systems **2016 ISC WEST**	Smart City 2016 **Best Smart IoT Security** **Winner**	**SAFE SKIES**
		Smart City 2016 **Best Smart City** **Winner**	**Safe Skies Tested & Approved 2016**

Outdoor Industrial IoT Challenges

1 Planning, executing and permits can be time consuming

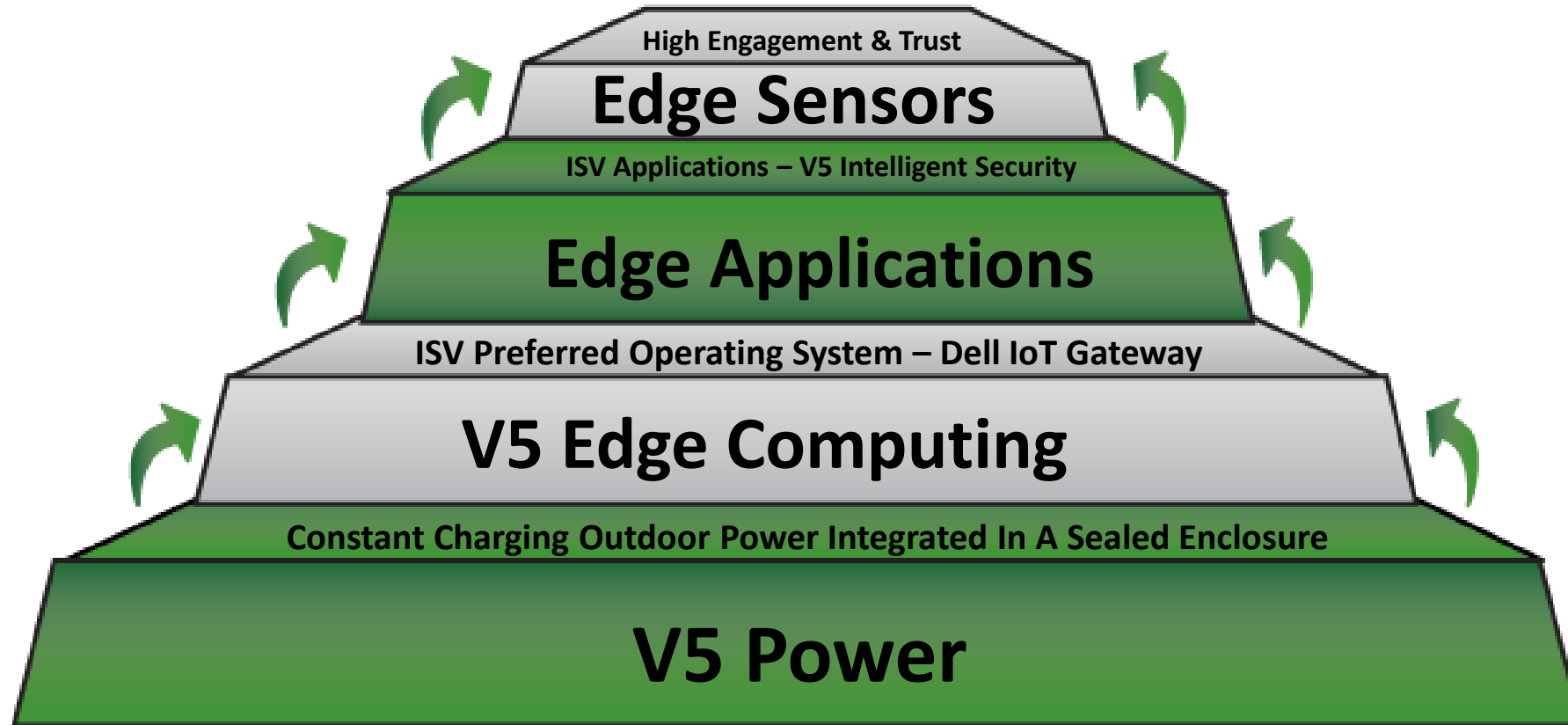**2** Too costly or difficult to tap into power and connectivity

3 IT/OT challenges connecting multiple nodes

4 Processing data that matters in real time - at the edge

V5 Technology Layers

High Engagement & Trust

Edge Sensors

ISV Applications – V5 Intelligent Security

Edge Applications

ISV Preferred Operating System – Dell IoT Gateway

V5 Edge Computing

Constant Charging Outdoor Power Integrated In A Sealed Enclosure

V5 Power

V5 Portable Building Blocks for
Self-Powered Outdoor Applications

Self-Powered Edge Systems

V5 portable power, security and computing platform for outdoor applications

Independent of the power grid and wired networks

Portable Power	• Perpetual Outdoor Power for 3rd party hardware products
Portable Edge Computing	• Self Powered Server for outdoor deployments of 3rd party software, hardware and sensors
Portable Camera Adaptive Platform	• Self Powered Axis Communications video cameras and wireless communications
Portable Security Units	• Self Powered Integrated video surveillance, acoustic and chemical detection

V5 Portable Power

What Can You Implement With Perpetual Power Independent of the Power Grid?

Edge Power – V5 PPU

Delivers perpetual power [5v, 12v, 24v, 48v]
Integrated Multiple Battery Subsystems
Power Management/Switching
4 hours, on average, of sunlight on V5 Solar Panels

1,000+ Watts Of Power

IP67 Ruggedized Enclosure

Compact Form Factor

Less than 25 lbs.

V5 Solar Panel

Primary Source of Power for V5 Portable Units

Durability to Handle Challenging Weather Conditions

Bullet Resistant

Half the Weight of Traditional Solar Panels

Higher Energy Yield

Low Resistance

Physical Security Solutions

V5 Camera Adaptive Platform [CAP]

V5 Portable Security Unit [PSU]

V5 Systems Confidential

Edge Security – V5 CAP

V5 Camera Adaptive Platform

Integrate 3rd Party Video Cameras onto V5 CAP units for deployment in outdoor environments

Designed to work with customers backend VMS applications and communication ports

Compatible with PoE, 5Volts, 12Volts and 24Volts camera power requirements

Integrated cellular and WiFi support

Add on RF Communications

Video Camera Partners

Outdoor deployments of
V5 Portable Power,
Computing, Wireless Communications
Partner video cameras
independent of the power grid & wired networks

HITACHI
Hitachi Data Systems

AXIS
COMMUNICATIONS

Panasonic
ideas for life

BOSCH
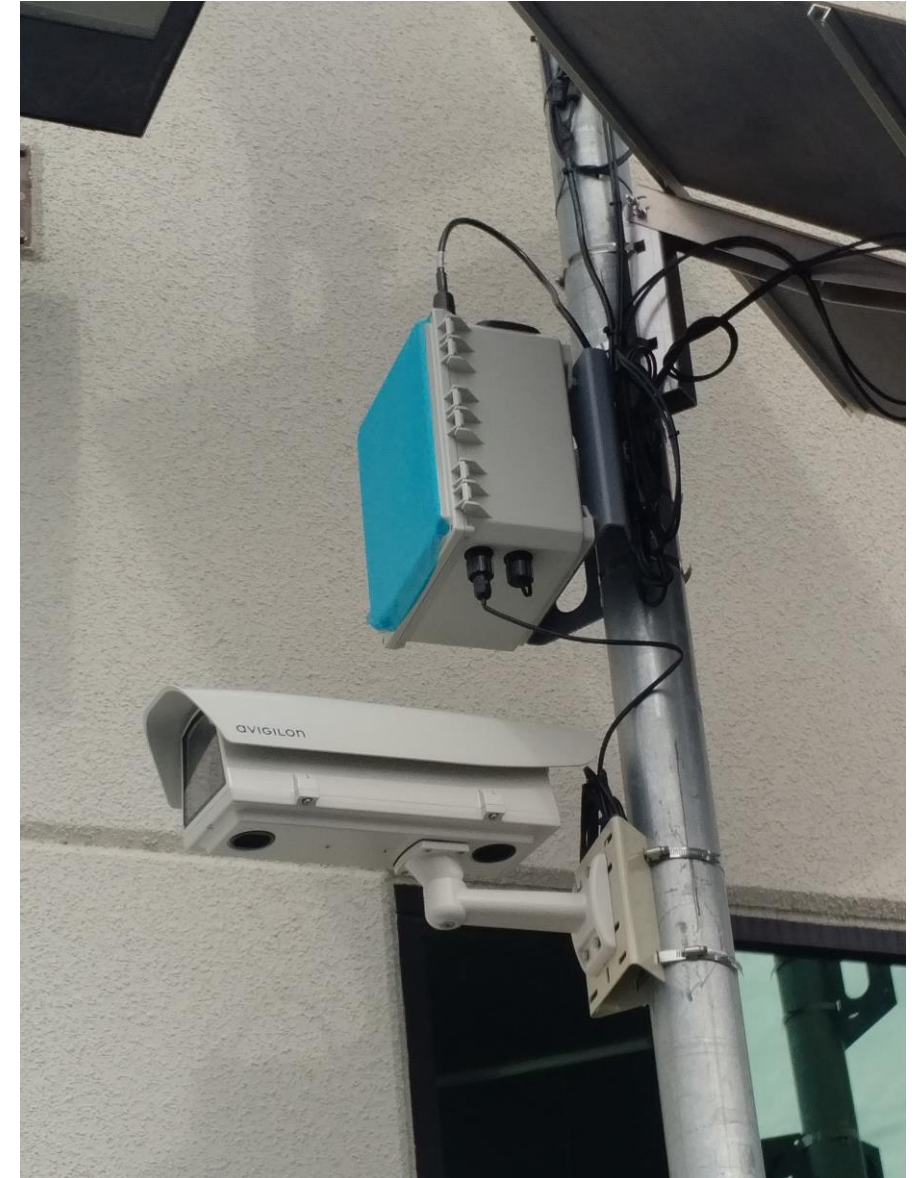
Edge Security – V5 PSU

V5 Portable Security Unit

24"

36"

22"
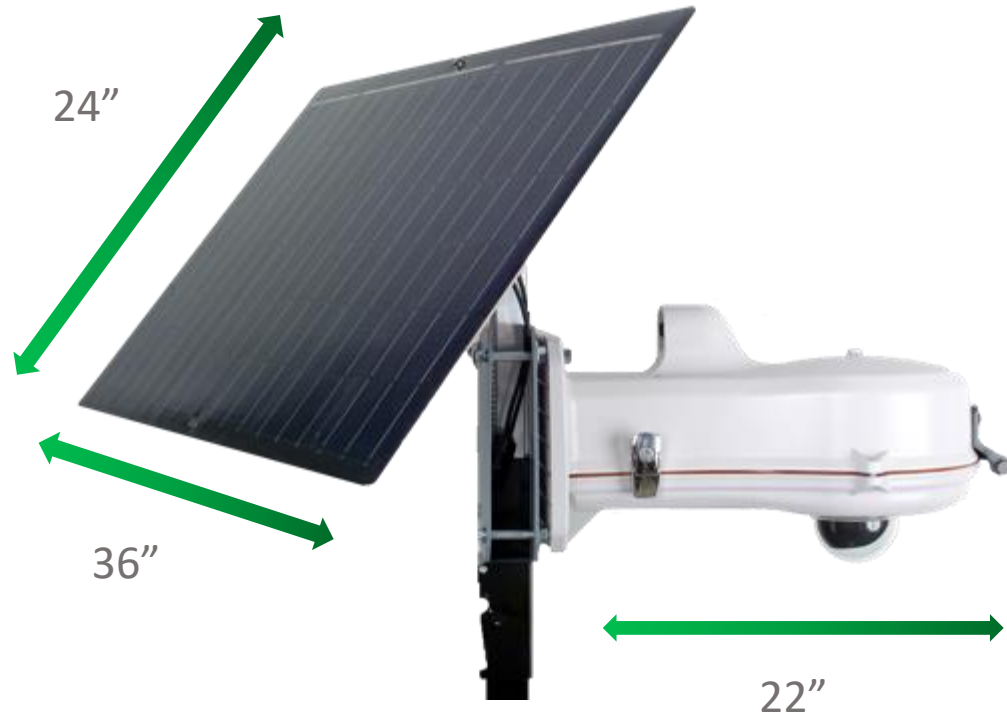
Turnkey, all-in-one self contained system

Proprietary power via V5 power management system & V5 solar panels

Video storage – Up to 1TB Intel Based on board storage and/or back end server

Ruggedized enclosure with industrial grade components

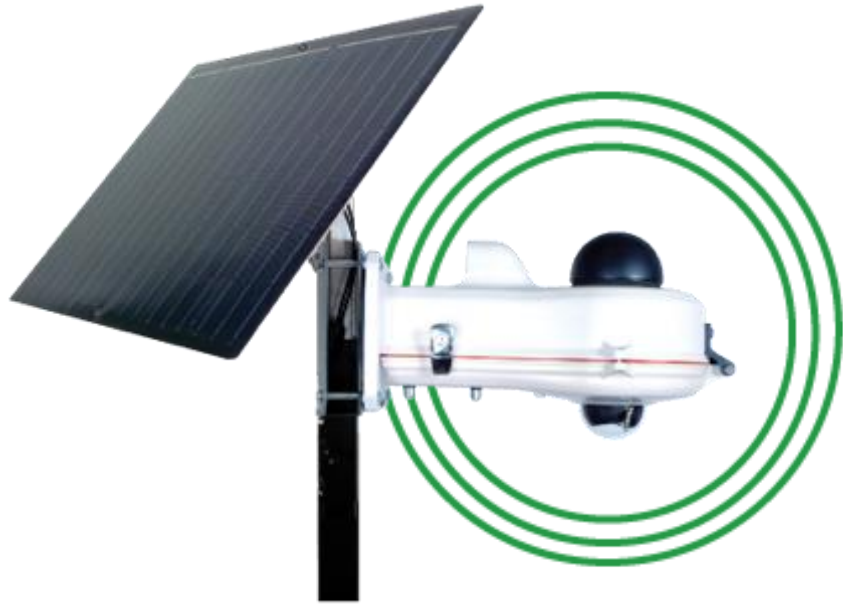Less than 2 ft. long and less than 25 lbs.

Configure & Install in under 30 minutes

The Most Advanced Outdoor Security System w/Video, Acoustic and Chemical Sensors

V5 Gunshot Sensor

Outdoor Portable Acoustic Tracking - Location & Detection

Gunshot Sensor on PSU

Gunshot Sensor on PECU

- The ability to detect acoustic events of interest from ambient environmental audio using pre-trained Artificial Intelligence methodologies
- Current event detection for gunshots and fireworks
- Future event detection for spray cans to mitigate graffiti damage
- Trainable to detect any sound signature
- Provides a direction to the source of an event of interest if detected by one unit
- Provides a 2D or 3D pinpoint of the location of the event of interest, if two or more units detect the same event

Modular Design

PECU
(Portable Edge Computing Unit)

PSU-PTZ
(Pan, Tilt Zoom)

PSU-Streaming

Acoustic Sensor – Gunshot Detection

PSU
(Portable Security Unit)

Lidar
V5 Predictive AI

CAP
(Camera Adaptive Platform)

PSU-LPR
(License Plate Reader)
V5 Predictive AI

V5 Edge
Core - Cloud

Outdoor Self-Powered Edge

Core - Cloud

Cellular
WiFi
RF
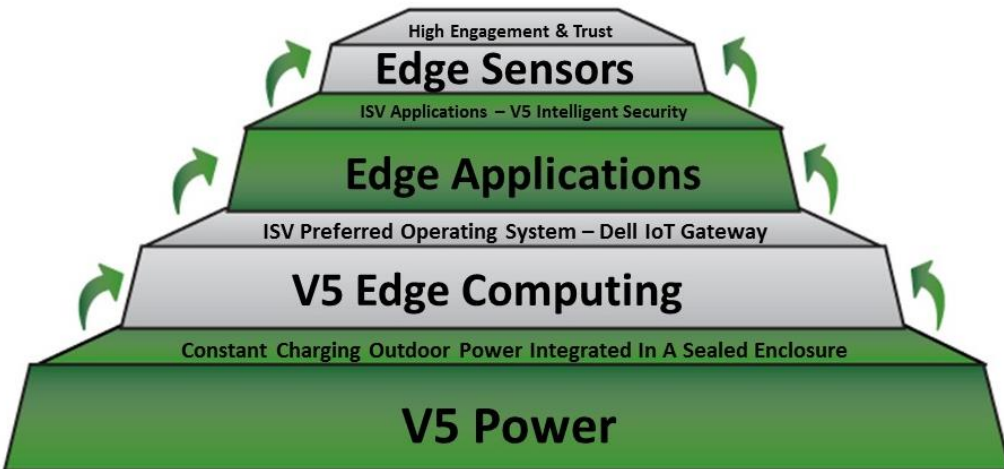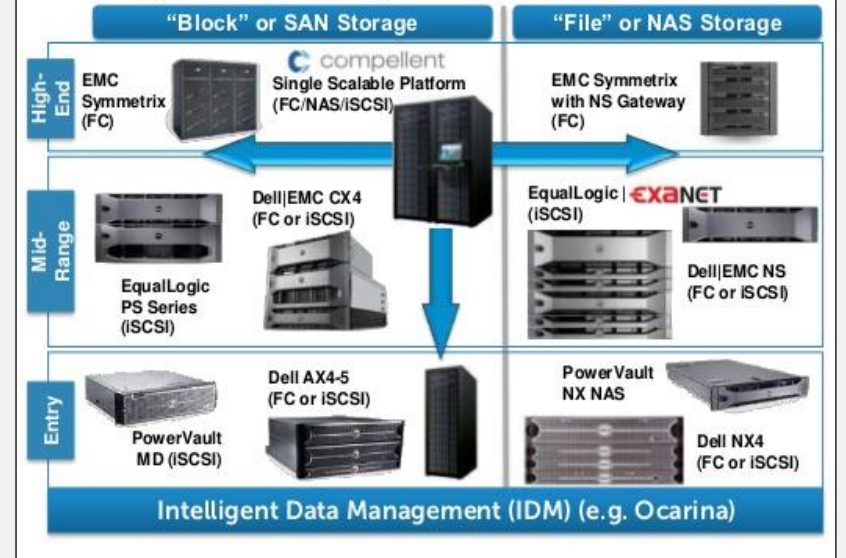
Dell PowerEdge FX2 Servers
Dell EMC Storage Solutions

Markets

The Department of Homeland Security (DHS) is responsible for securing federal civilian networks, the nation's cyberspace, and critical infrastructure.

https://www.dhs.gov/critical-infrastructure-sectors

Portable Edge Computing

Self Powered Edge Computing
Software Applications deployed outdoors
Independent from the Power Grid and Wired Networks
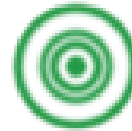
V5 Edge Computing – V5 PECU

Intelligent

Dell IoT gateways, Linux or Windows based computing system with multi-core processors

Modular design to integrate 3rd party software applications validated on Dell Gateways

Modular design to integrate 3rd party hardware devices

Wireless Communications via WiFi, Cellular and Long Range RF

Real time processing of relevant information via edge computing

The World's First Self-Powered, Wireless Computing Solution

V5 Portable Edge Computing Unit (PECU)

Advanced Computing Platforms for Industrial IoT Applications
"Bring your own IP and SI" integrated 3rd party hardware, sensors and software

V5 PECU

Dell Industrial
IoT Gateways

Intel i7/m7-class Performance

IoT Applications

IOT Impact Labs - https://iotimpactlabs.com/
has over 100 IoT projects in various stages of evaluation and development
Dell EMC and Intel sponsor INEX Advisors - http://www.inexadvisors.com/ and IOT Impact Labs.
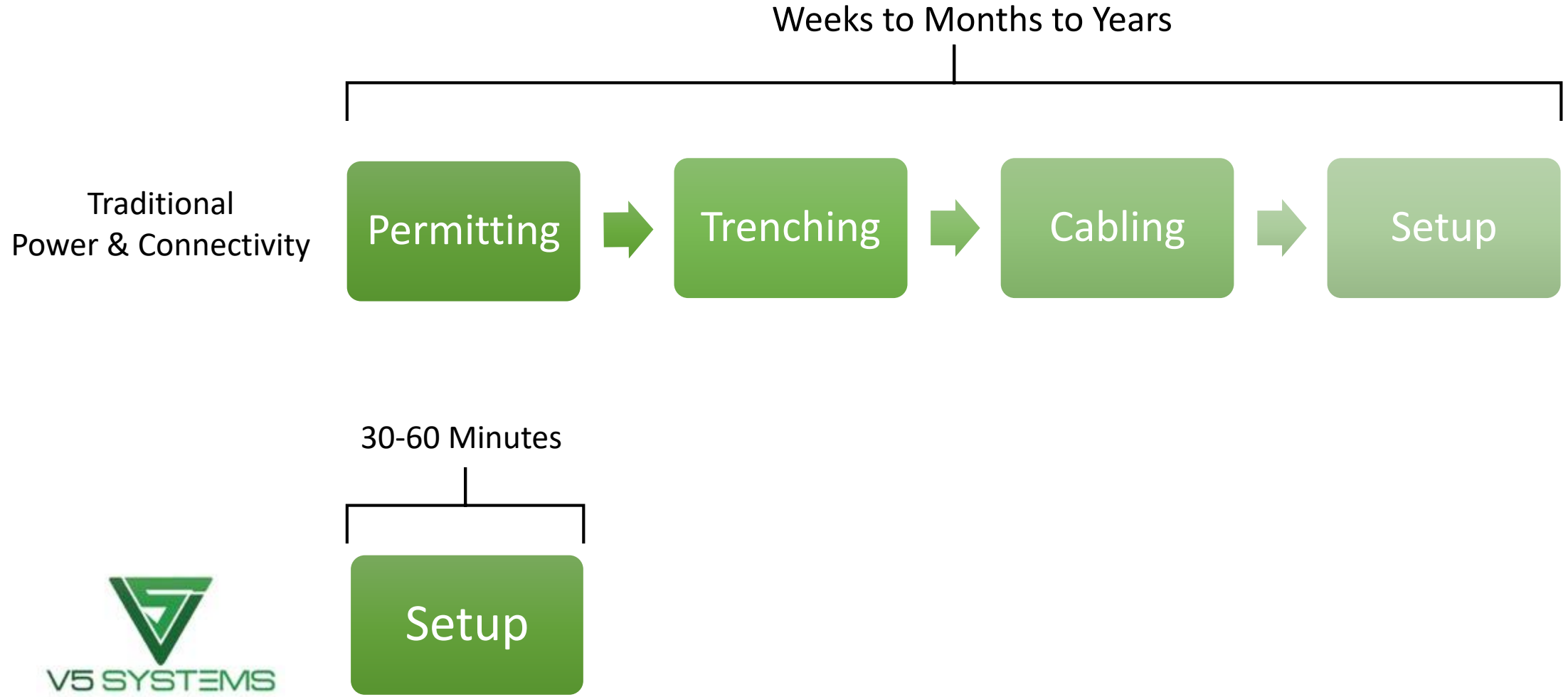

*IoT Impact LABS brings together early stage IoT companies, tech and industry leaders,
small and mid-sized enterprises and subject matter experts
to instrument the physical world with intelligence and intention for profit and resilience.*

We are a proof point production plant.
*We live-pilot early stage IoT solutions with Fortune 500 technology and industry partners in the
field with real-world innovators in small and mid-sized enterprises.*

Unprecedented Time to Value

Weeks to Months to Years

Traditional
Power & Connectivity

Permitting → Trenching → Cabling → Setup

30-60 Minutes

Setup

Use case examples

V5 Portable Security Unit [PSU]
V5 Portable Edge Computing Unit [PECU]

PSU Use Case

City Of Hayward/PD– Video Security In and Around City Hall

Problem Statements:
- Theft and drug crime in and around city hall due to open areas and it's close proximity to the main rail transportation for the bay area (BART)
- No power infrastructure where crime activity was happening

Components To Solve Problem:
- V5 Systems PSU = Solar-Powered Portable Security Units

Expected ROI:
- Trenching fees around $750K per mile
- 60% drop in calls for crime

Google Map View Of Deployed V5 Units
On V5 Systems User Interface

PSU Use Case

San Jose State University – Situational Awareness And Gunshot Detection

Problem Statements:
- Security in areas around campuses without power access
- Gunshot detection for campus

Components To Solve Problem:
- V5 Systems PSU = Solar-Powered Portable Security Units
- V5 Systems Gunshot Sensor = Sensor integrated on V5 Systems PECU Units

Expected ROI:
- Trenching fees around $750K per mile
- $250K per sq. mile per year for traditional gunshot monitoring

PSU Use Case

New Bedford Harbor - Palmers Lighthouse & Dockside

Problem Statement:
- Vessel ID for "Legal" Docking activity
- ID Chemical/Radiation Threats

Components To Solve Problem:
- Systems Integrator: INEX Advisors
- Axis Communications IP Camera = Vessel ID
- GE Current IP = Chemical/Radiation station
- V5 Systems Portable Security Unit with Analytics [captures the bows of boats for ID attestation]
- V5 PECU; V5 Power Units

ROI:
- $250K in Docking Fees and Fines collected per year

PECU Use Case

Salt Creek Vineyard - Micro Climate Weather Stations

Problem Statements:

- Smart Irrigation in Viticulture
- Designing for Predictive Analytics for higher Yield

Components To Solve Problem:

- Systems Integrator: INEX Advisors
- Davis Instruments IP = Weather Sensors and Instrumentation
  - full stack exfil MQTT for incorporation into different dashboards
- V5 Systems PECU = Solar-powered Dell Gateway

Expected ROI:

- Improve yield and quality of production, especially in red varietals subject to more risk
- 30% Reduction in Water Usage

Thank you!

www.v5systems.us