

# NS2024

APRIL 15 - 17 | ANAHEIM, CA



# Disclaimer

- **This session is provided for information purposes. The views, information, or opinions expressed during this presentation and/or its associated/referenced materials are solely those of the individuals and/or organizations involved and do not represent those of Tridium, its affiliates or its employees.**
- **With respect to this presentation and the information and materials presented, Tridium makes no warranties, express or implied, including the warranties of merchantability and fitness for a particular purpose, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately owned rights.**
- **Tridium is not responsible for and does not verify the accuracy or reliability of any of the information contained herein. Results referenced, if any, may vary and past performance is not indicative of, and Tridium does not guarantee, future results. This information does not constitute professional or other advice or services and is presented for informational purposes only.**



NS2024

POWER OF PARTNERSHIP

# Niagara Beyond Buildings



**Paul Price**  
Moderator

**Smart Building Evangelist**  
Tridium



**Gary Ament**  
Presenter

**Solutions Architect**  
FSG Smart Buildings



**Mark Tubinis**  
Presenter

**Chief Commercial Officer**  
Veeva



**Ged Tyrrell**  
Presenter

**CEO**  
Tyrrell Building  
Technologies



# Beyond Buildings

*Gary Ament*  
*Solutions Architect*

*FSG – Smart Buildings*

**NS2024**  
APRIL 15 - 17 | ANAHEIM, CA

# Challenges

- **Savings opportunities in the car waMonitor, control, alarm, and respond**
- **Biggest concern – freezing equipment leads to loss of revenue & damaged equip**
- **Control heat and lighting**
- **Alarm when equipment is endangered**
- **System cost is a big consideration**
- **Proactively notify when systems are not working as intended**



**NS2024**  
APRIL 15 - 17 | ANAHEIM, CA



# Project Execution

- **Use hardened solutions for C-store challenges in this car wash application**
- **Distributed Control is critical. System must be able to function stand alone.**
- **Fast, easy to scale deployment**
- **Control heat and lighting**
- **24/7 monitoring and notification on anything that threatens car wash security, equipment health or effective operations.**

**NS2024**  
APRIL 15 - 17 | ANAHEIM, CA

# Outcomes Achieved

- **Met the customer need for an affordable, scalable control solution.**
- **Distributed control ensures the system works with or without connectivity**
- **Car wash added to existing store's BAS interface, FSG's Chariot dashboard**
- **Notification of issues before they become problems that could force closure & loss of revenue through FSG's 24/7 Customer Support Center**
- **Developed a new core product for FSG Smart Buildings, the Clarity Agile Connect, suitable for facilities with smaller footprints and less equipment.**
- **Opens new opportunities for small and micro box retail that have been underserved by BAS vendors due to system cost and ROI requirements**



**NS2024**  
APRIL 15 - 17 | ANAHEIM, CA

## How can this be packaged and commercialized?

- *Clarity Agile Connect*



# Beyond Buildings

*Mark Tubinis*  
*Chief Commercial Officer*

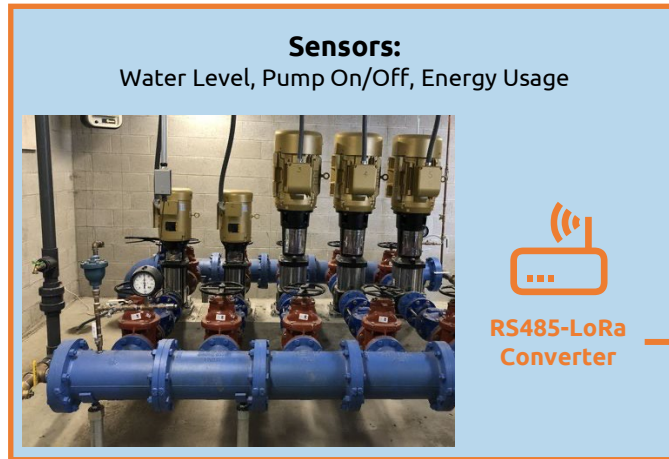
*Veeva, Inc.*

**NS2024**  
APRIL 15 - 17 | ANAHEIM, CA

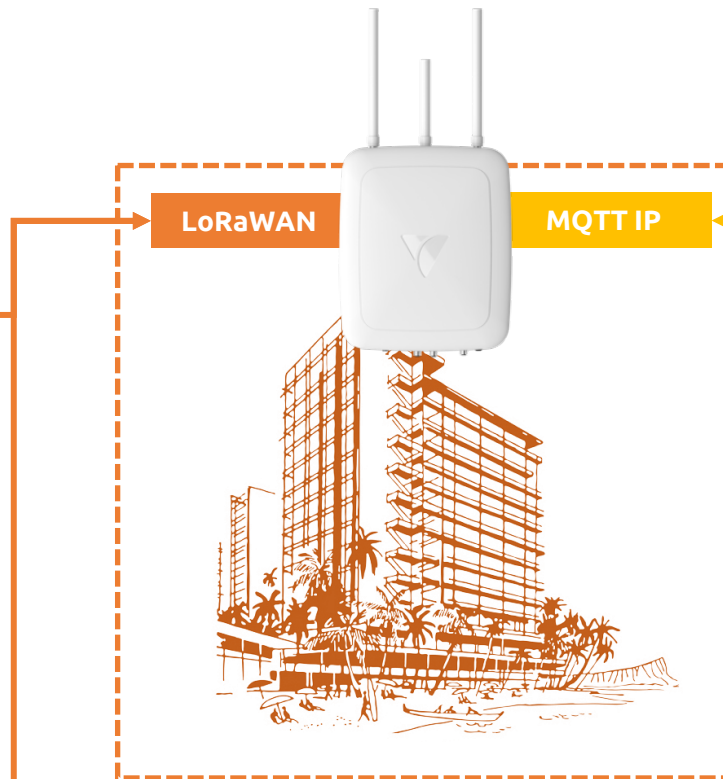


# Example Deployment: LoRa, Modbus and Niagara

## Individual Water Pump Locations



## Single Rooftop-Mounted Outdoor VeeHub



## Niagara System IP Network Dashboarding Control at Separate Property Location



# Climate Smart Agriculture Solutions

## Smart Irrigation

Streamline Watering Process to Enhance Productivity

## Greenhouse Automation

Automate Actions to Achieve Remote and Real-time Management

## Weather Monitoring

Live Stream Weather Data to Plan, React, and Grow Better

## Animal Tracking

Protect Animals in Case of Straying, Theft, and Accidents





# Rural Broadband Opportunities Across America

BEAD

\$42.45B

Broadband Equity, Access  
& Deployment Program



## Benton County

US county in Indiana

Benton County is located in the northwest part of the U.S. state of Indiana, along the border with Illinois. As of 2010, the county's population was 8,854. It contains six incorporated towns as well as several small unincorporated settlements; it is divided into 11 townships which provide local services. [Wikipedia](#)

**Area:** 407 mi²

**Founded:** 1840

**Population:** 8,714 (2021)

**Unemployment rate:** 2.6% (Nov 2022)

**Largest city:** Fowler

**Congressional district:** 4th

**Cities:** Fowler, Oxford, Earl Park, Boswell, Ambia, Templeton, Chase

## Program Highlights

- Federal grant to increase availability or high-quality broadband to homes, farms and Community Anchor Institutions
- Monies have been allocated projects starting now
- Money for Community Development, health care and climate smart Infrastructure

## Project Partners

# Workforce Development and Expansion



## Veeva

We are the creators of an extensive, adaptive, flexible, and scalable Edge Computing Ecosystem – and we work with our partners to develop and deliver smart solutions tailored for the next age of connectivity.



## AmeriCrew & National Warrior Workforce

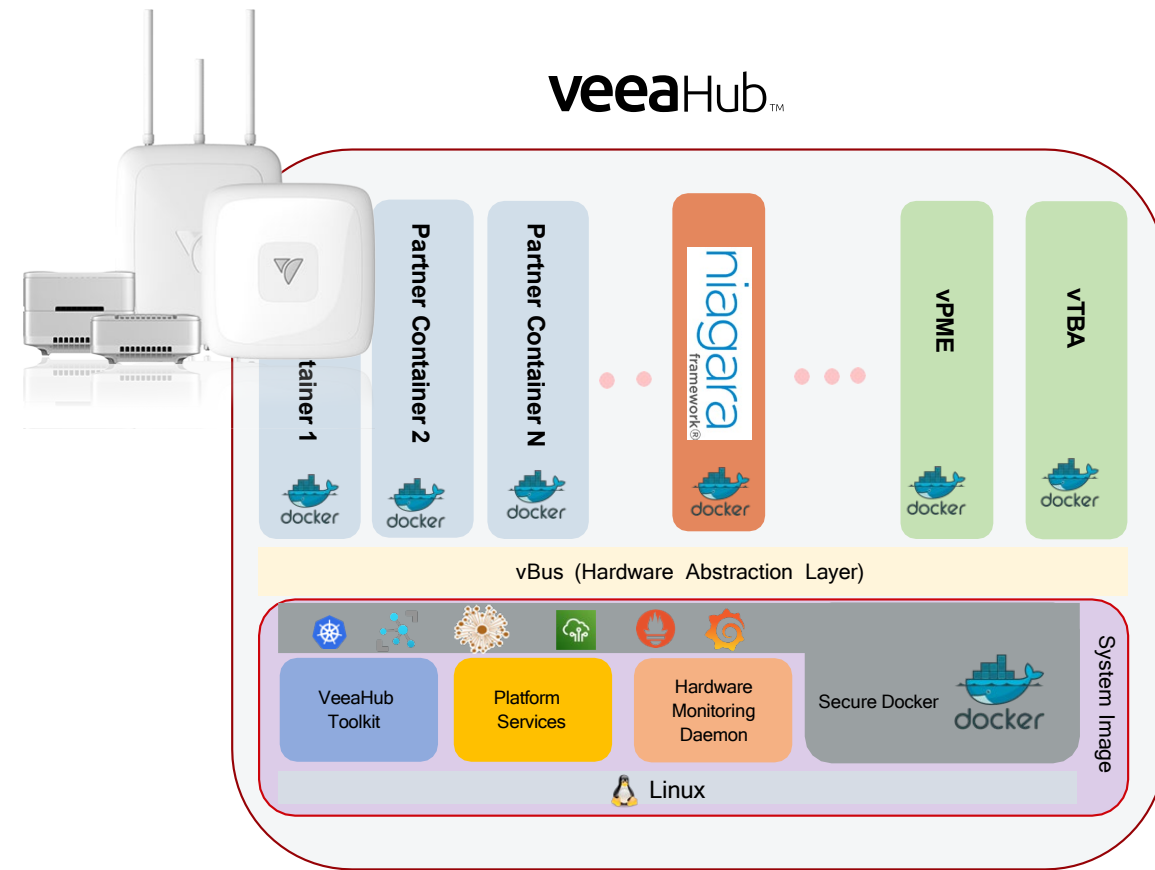
National Warrior Workforce provides industry approved and in-demand training and job placement for our nation's veterans and transitioning service members for a career in 5G wireless, fiber broadband, and clean energy infrastructure. AmeriCrew employs NW2 for nationwide apprenticeships based on 12 planned regional centers.



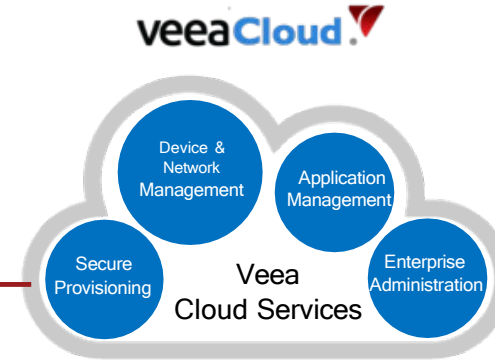
## QBS Learning

- QBS is a leading provider of **content** and **curriculum** development, creative services, and digital and design excellence. QBS is the trusted, **go-to partner** by premier traditional and EdTech publishers.

# Veeva Edge Platform & Containerized Niagara



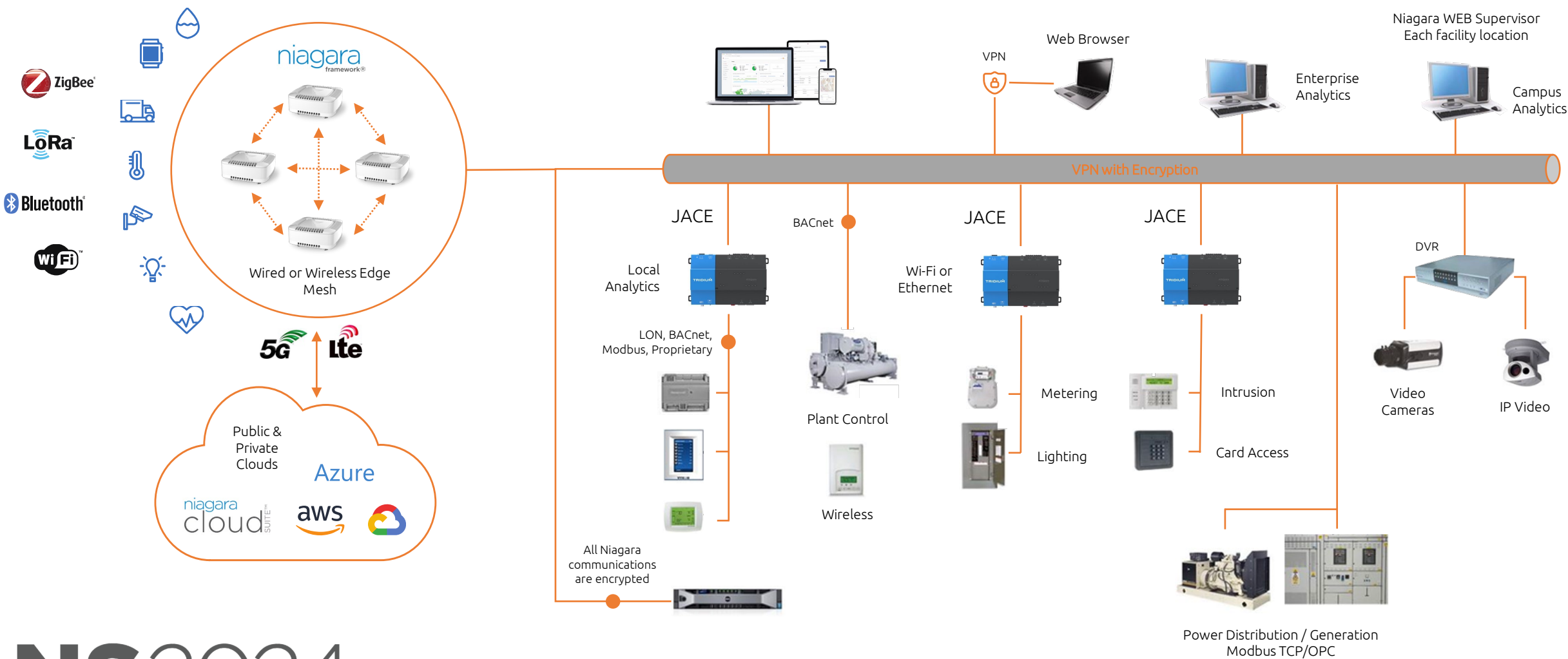
## Veeva Control Center



- Patent Pending Secure Docker Container System
- vMesh – Highly extensible device connectivity (wired and wireless) and application mesh
- vBus Hardware Abstraction Layer – Enable devices (IP and non-IP) to securely connect to containers distributed across vMesh
- veevaCloud – Orchestration and Management, Remote Management of VeevaHubs & Niagara



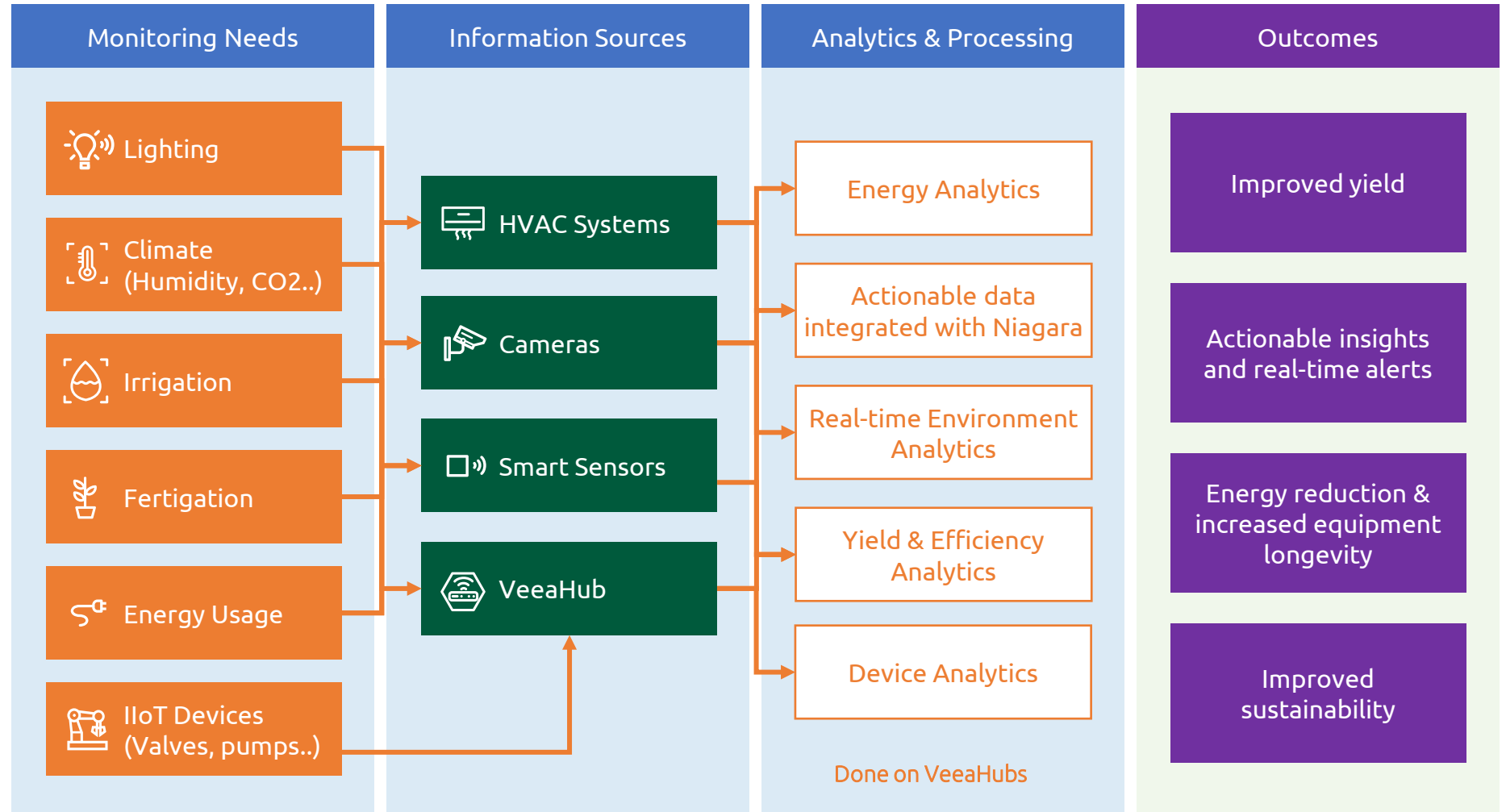
# Veea / Local BMS Solution Integration





# Example Deployment: Climate Smart Agriculture

Climate Smart Agriculture has more connected devices, gathering more data, resulting into more insights and continuous improvement of yield, efficiency, sustainability and quality of life.



Done where the data is generated by Veeah Edge Platform

# Beyond Buildings

*Ged Tyrrell*  
**CEO**

*Tyrrell Building Technologies*

**NS2024**  
APRIL 15 - 17 | ANAHEIM, CA



**Tyrrell Building Technologies is a PropTech group helping clients optimise building performance reduce running costs, report on compliance and achieve their ESG goals.**



**Product R&D, Distribution and Training for System Integrators**



**Master System Integrator, IoT, Support & Engineering Company**



**Smart Building Analytics and Reporting Platform**

# London Underground Passenger Safety



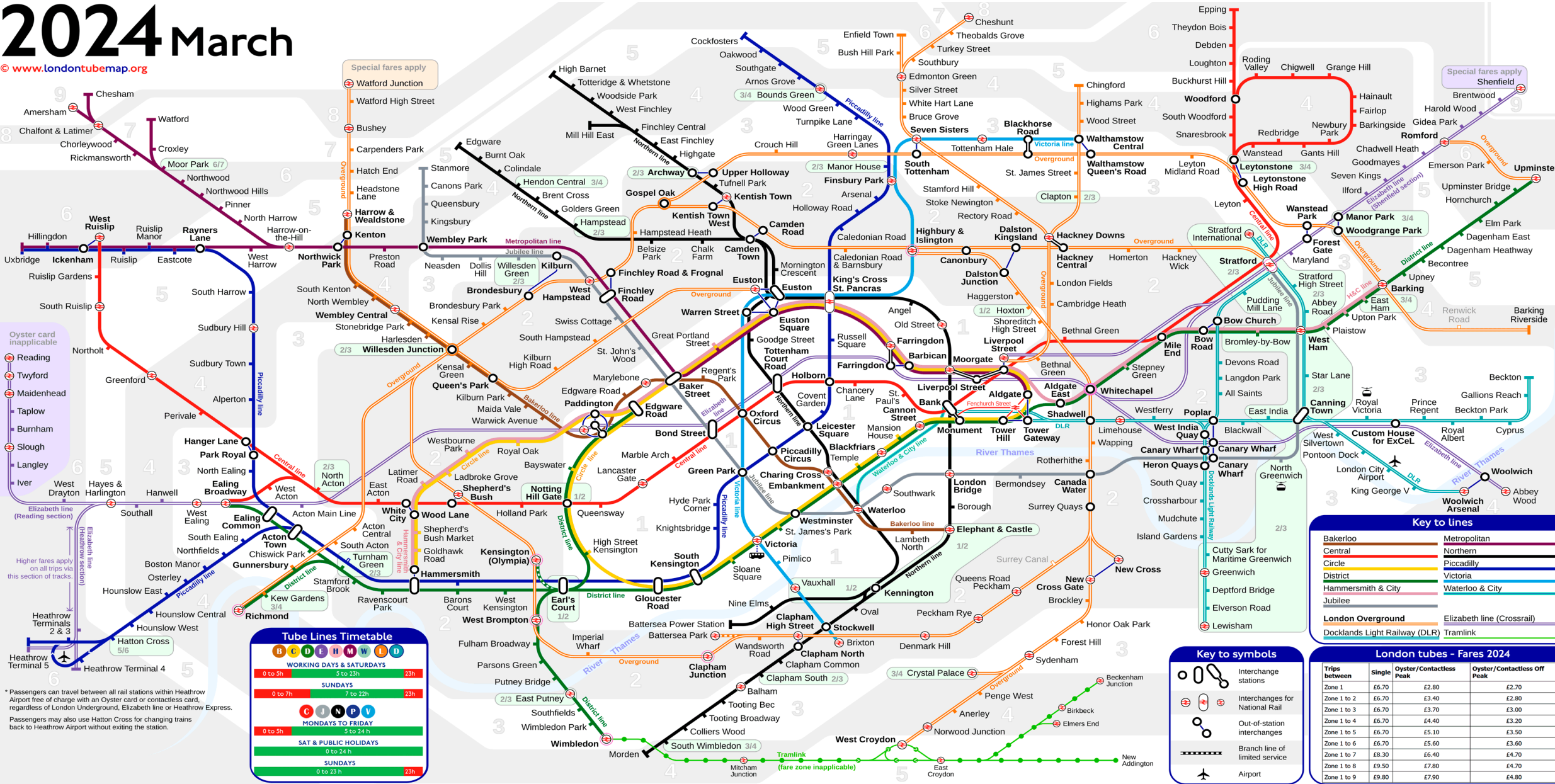
*Powered by the Niagara Framework*

**NS2024**  
APRIL 15 - 17 | ANAHEIM, CA



# 2024 March

© www.londontubemap.org



\* Passengers can travel between all rail stations within Heathrow Airport free of charge with an Oyster card or contactless card, regardless of London Underground, Elizabeth line or Heathrow Express. Passengers may also use Hatton Cross for changing trains back to Heathrow Airport without exiting the station.







# Industrial IoT Safety Systems & Solutions

- *Reduce the Number of Injuries*
- *Improve Behaviour on Escalators*
- *Influence Behaviour Around Elevators*
- *Gain Positive Staff Feedback*
- *Deliver a Positive Customer Experience*
- *Lower the Risk of Litigation*

**NS2024**  
APRIL 15 - 17 | ANAHEIM, CA

**NS2024**  
APRIL 15 - 17 | ANAHEIM, CA

## **The Solution**

*Cloud Programmable Dynamic  
Display with Annunciator*



# The Toblerone...

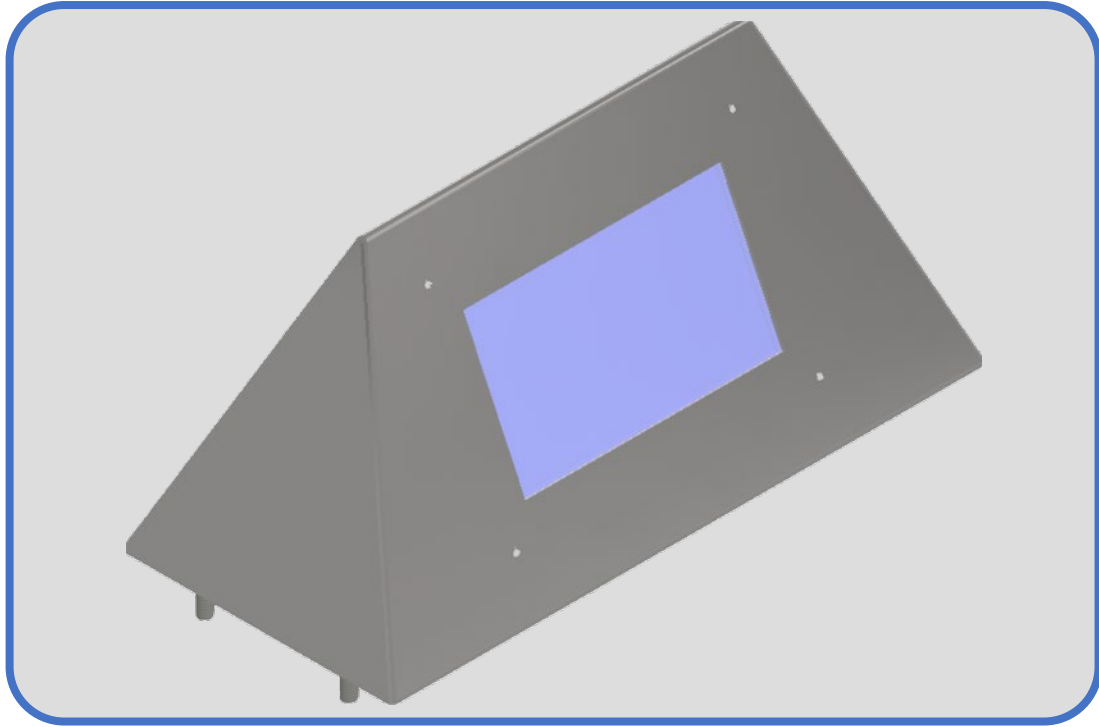
**NS2024**  
APRIL 15 - 17 | ANAHEIM, CA



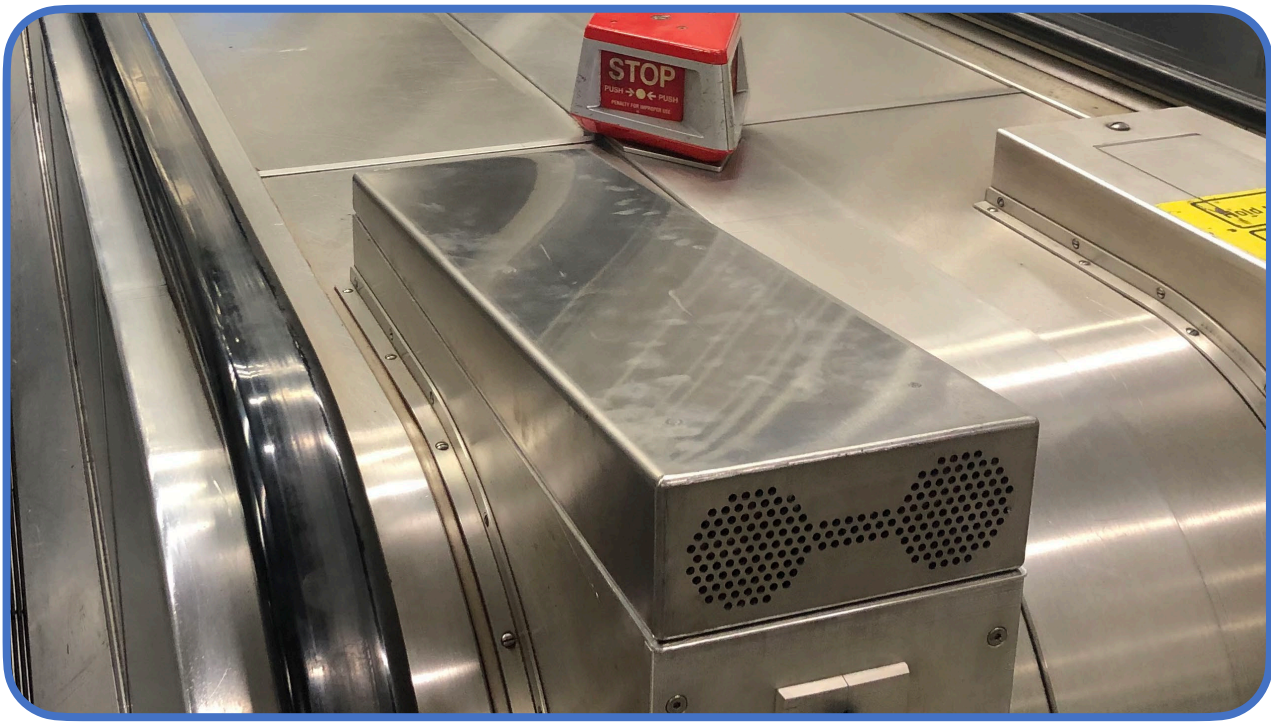
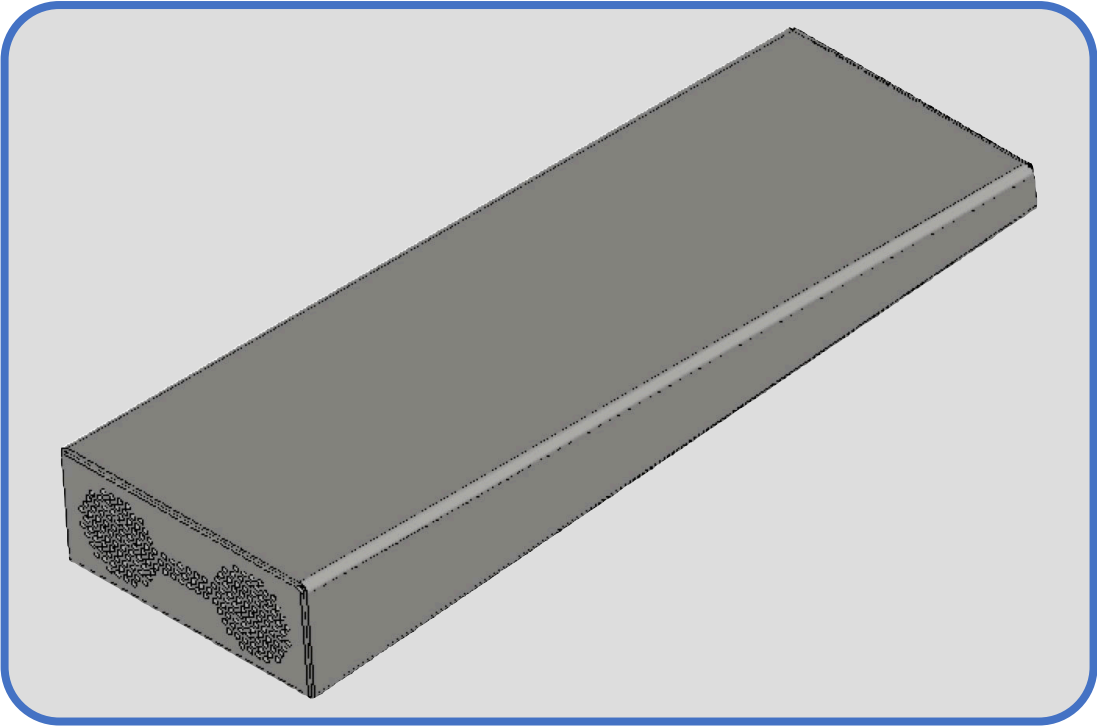




# The e-Toblerone

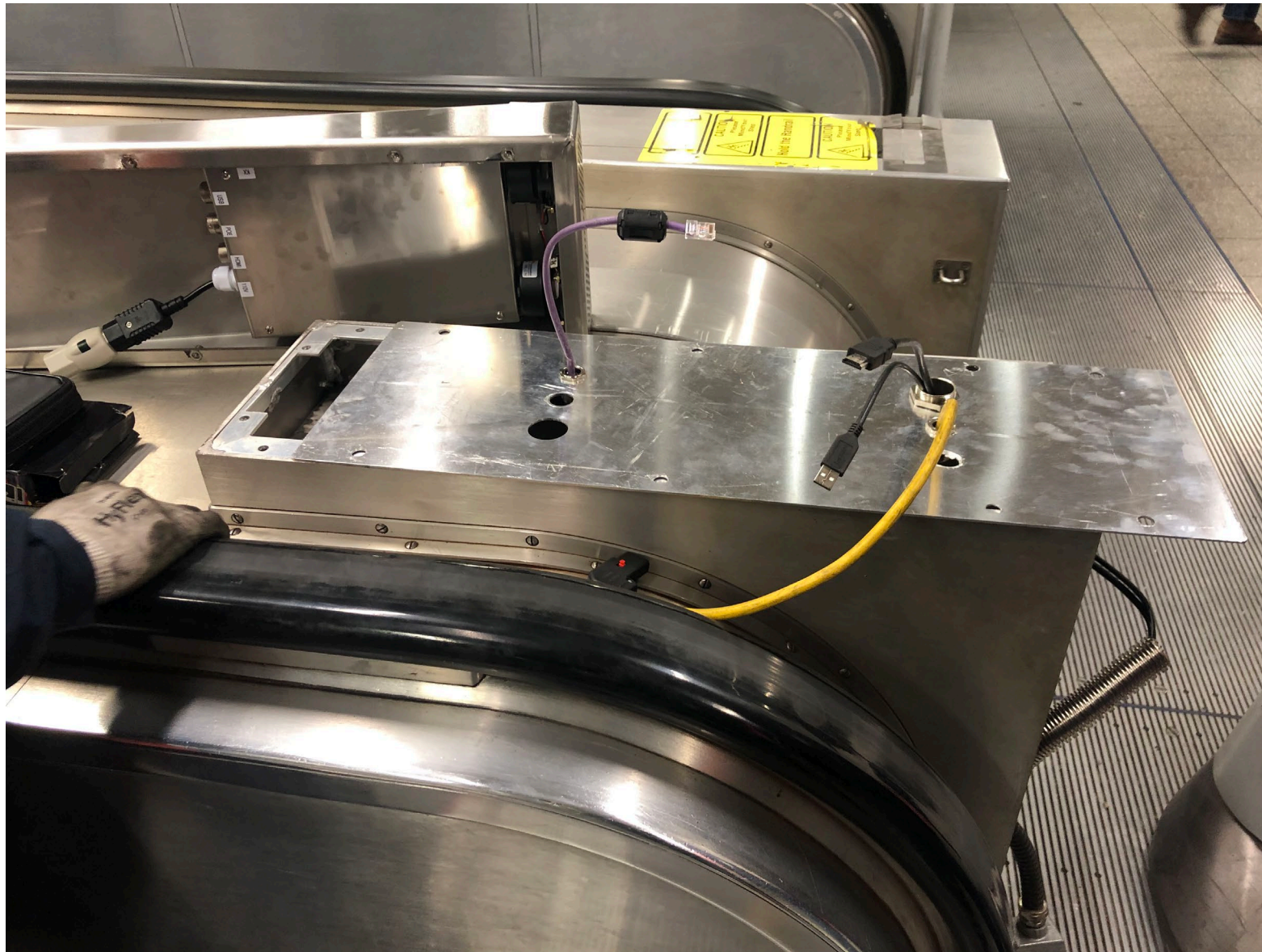


# The Annunciator

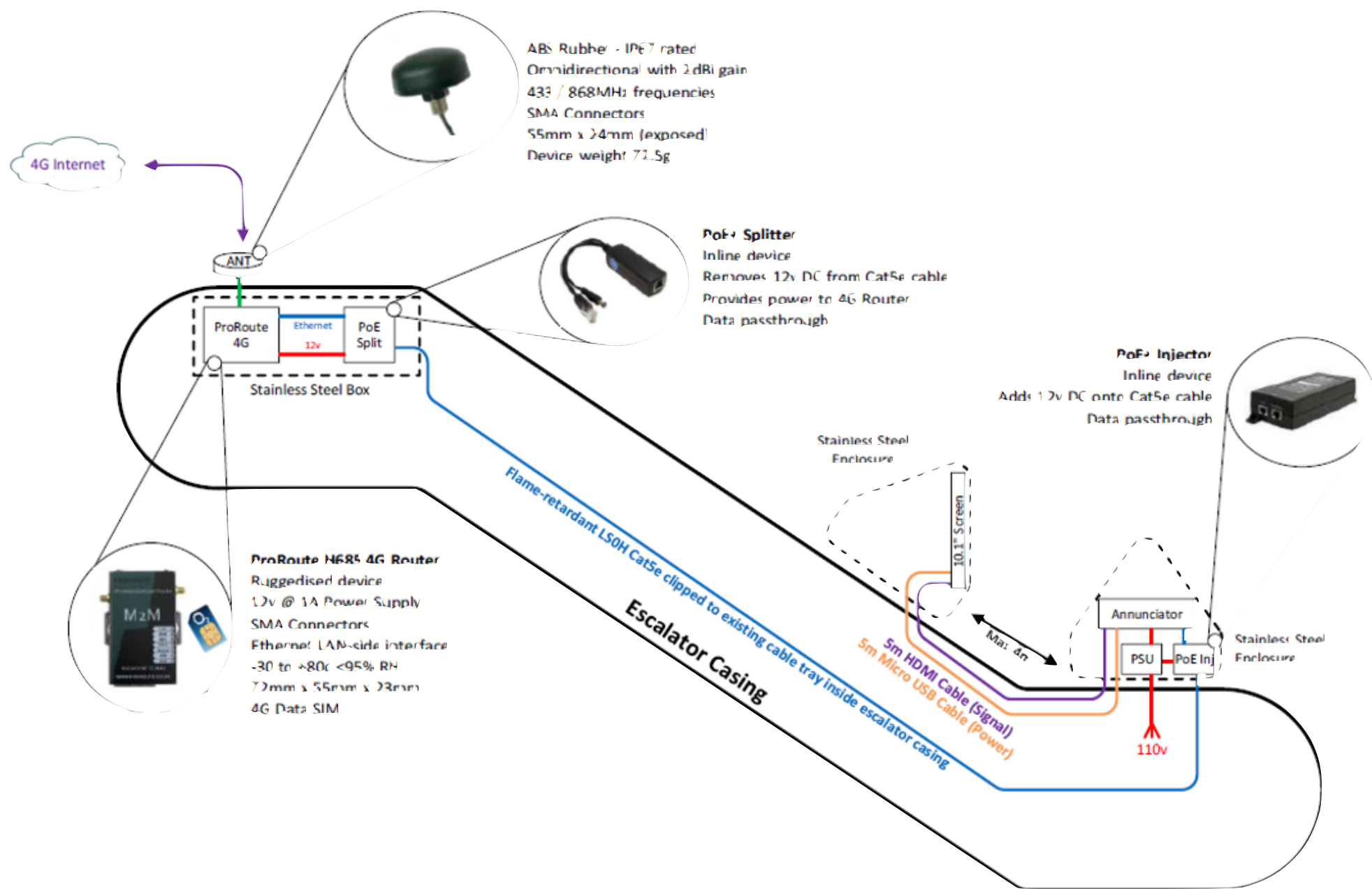








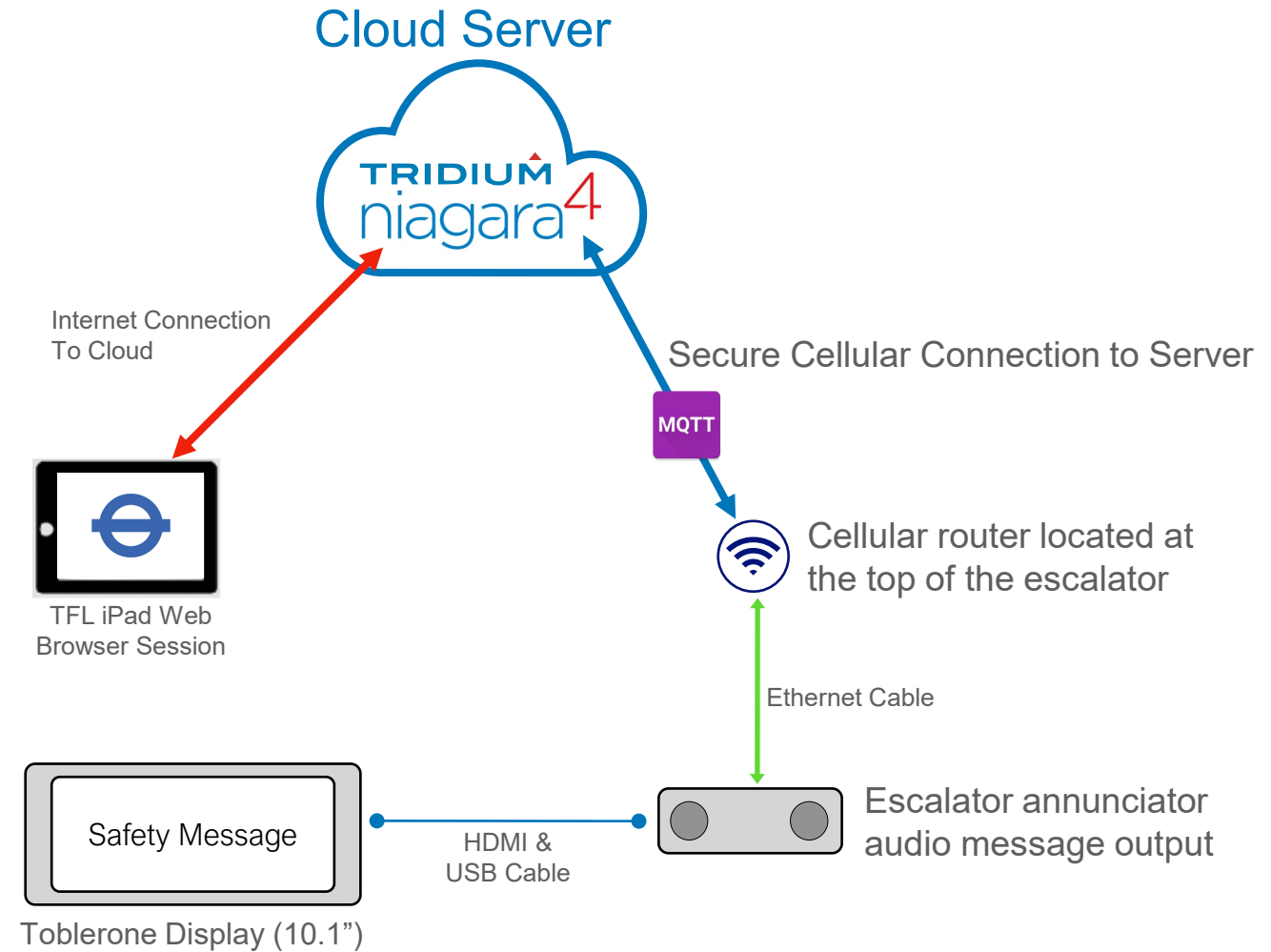




# NS2024

APRIL 15 - 17 | ANAHEIM, CA

## System Schematic



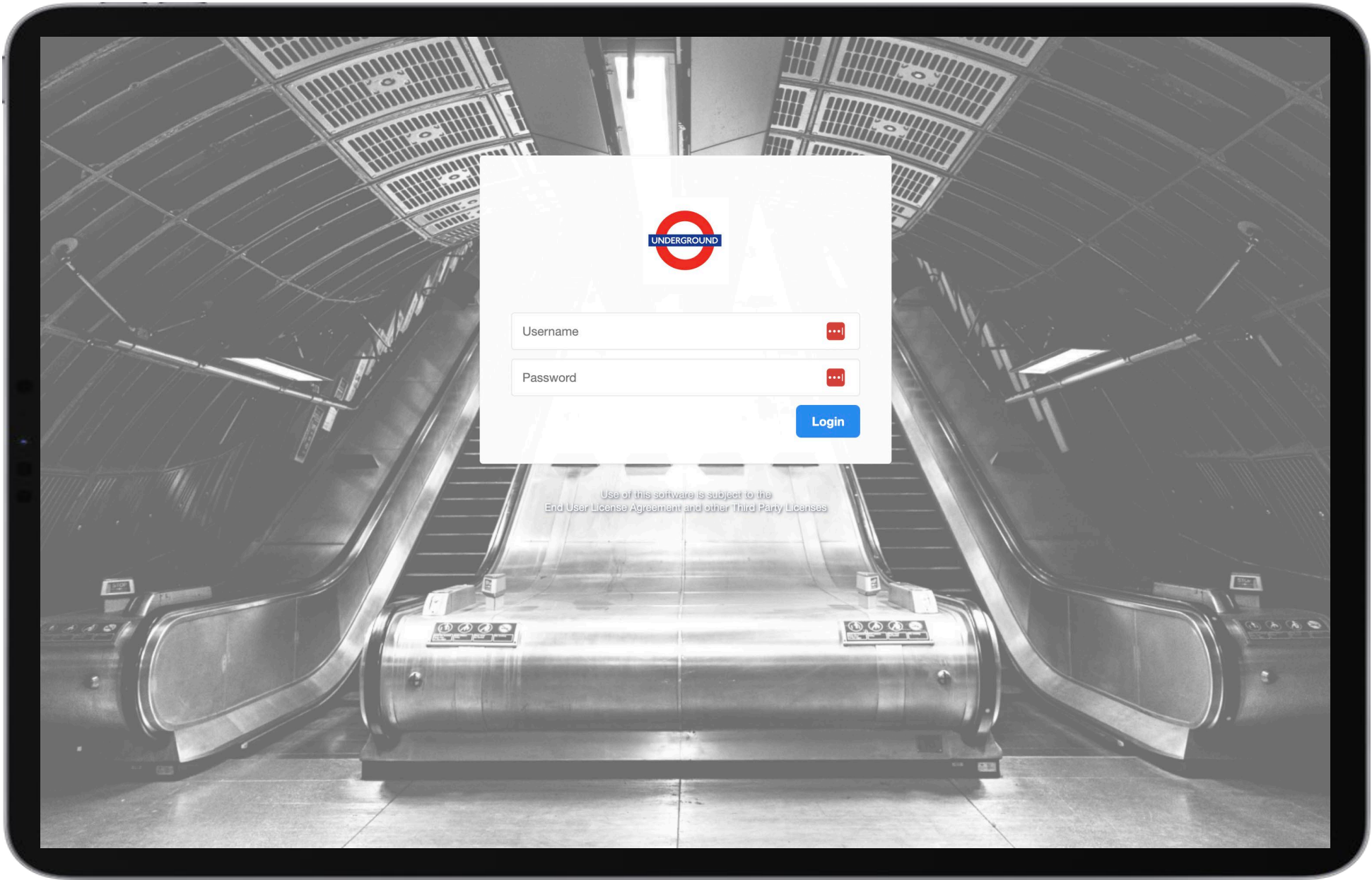
# Tyrrell MQTT Client

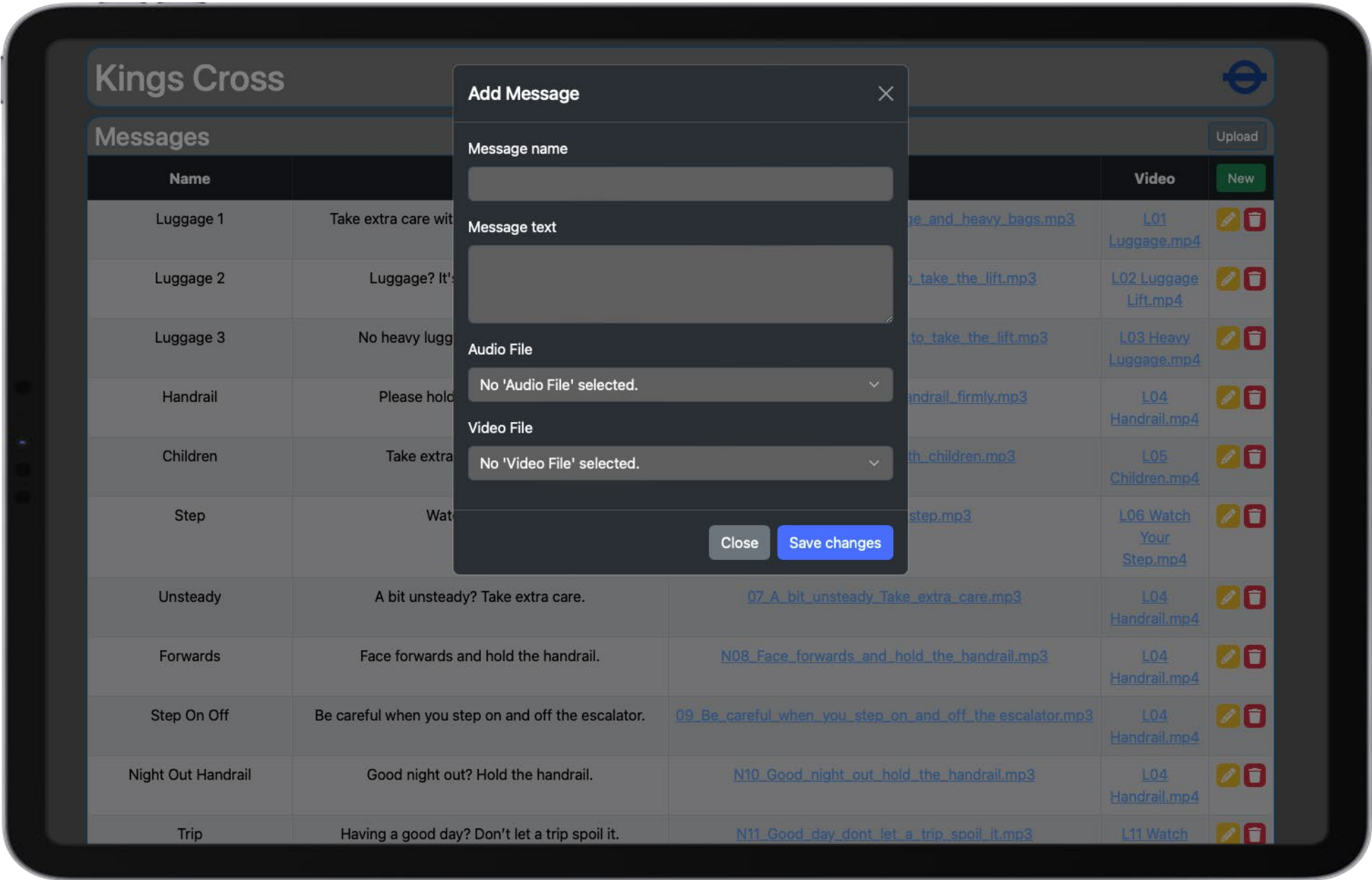
- *Broader Authentication Types*
- *Faster Setup*
- *JSON expertise not required*
- *One-off license*

```
},
{
  "sequence": 2976338,
  "timestamp": "2024-03-18T11:28:34.643Z",
  "txt": "[INFO] Current Playlist ID: 4"
},
{
  "sequence": 2976339,
  "timestamp": "2024-03-18T11:28:34.645Z",
  "txt": "[INFO] Playing playlist Interpeak, Take extra care with children"
},
{
  "sequence": 2976340,
  "timestamp": "2024-03-18T11:28:41.927Z",
  "txt": "[INFO] Current Playlist ID: 4"
},
{
  "sequence": 2976341,
  "timestamp": "2024-03-18T11:28:41.928Z",
  "txt": "[INFO] Playing playlist Interpeak, Luggage? It's safer to take the lift"
},
{
  "lastLogSequence": 2976285,
  "messages": [
    {
      "audio": "01_Take_extra_care_with_luggage_and_heavy_bags.mp3",
      "audioChecksum": "YOtRpFO7MTBCS+X8GT7/sQ==",
      "audioLastModified": "2023-06-28T07:26:56.000Z",
      "id": 1,
      "name": "Luggage 1",
      "txt": "Take extra care with luggage and heavy bags.",
      "video": "L01 Luggage.mp4",
      "videoChecksum": "XC6w5QBRudbb6w0TK1GILQ==",
      "videoLastModified": "2024-01-19T09:26:00.000Z"
    },
    {
      "audio": "02_Luggage_its_safer_to_take_the_lift.mp3",
      "audioChecksum": "zqujQnwWlnx1lvOBbg7RVA==",
      "audioLastModified": "2023-06-28T07:26:56.000Z",
      "id": 2,
      "name": "Luggage 2",
      "txt": "Luggage? It's safer to take the lift",
```

**NS2024**  
APRIL 15 - 17 | ANAHEIM, CA








# Kings Cross



## Messages

Upload



















Name	Text	Audio	Video	New
Luggage 1	Take extra care with luggage and heavy bags.	<a href="#">01_Take_extra_care_with_luggage_and_heavy_bags.mp3</a>	<a href="#">L01 Luggage.mp4</a>	 
Luggage 2	Luggage? It's safer to take the lift	<a href="#">N02_Luggage_its_safer_to_take_the_lift.mp3</a>	<a href="#">L02 Luggage Lift.mp4</a>	 
Luggage 3	No heavy luggage, please use the lift	<a href="#">N03_Heavy_bags_its_safer_to_take_the_lift.mp3</a>	<a href="#">L03 Heavy Luggage.mp4</a>	 
Handrail	Please hold the handrail firmly.	<a href="#">N04_Please_hold_the_handrail_firmly.mp3</a>	<a href="#">L04 Handrail.mp4</a>	 
Children	Take extra care with children	<a href="#">05_Take_extra_care_with_children.mp3</a>	<a href="#">L05 Children.mp4</a>	 
Step	Watch your step	<a href="#">06_Watch_your_step.mp3</a>	<a href="#">L06 Watch Your Step.mp4</a>	 
Unsteady	A bit unsteady? Take extra care.	<a href="#">07_A_bit_unsteady_Take_extra_care.mp3</a>	<a href="#">L04 Handrail.mp4</a>	 
Forwards	Face forwards and hold the handrail.	<a href="#">N08_Face_forwards_and_hold_the_handrail.mp3</a>	<a href="#">L04 Handrail.mp4</a>	 
Step On Off	Be careful when you step on and off the escalator.	<a href="#">09_Be_careful_when_you_step_on_and_off_the_escalator.mp3</a>	<a href="#">L04 Handrail.mp4</a>	 
Night Out Handrail	Good night out? Hold the handrail.	<a href="#">N10_Good_night_out_hold_the_handrail.mp3</a>	<a href="#">L04 Handrail.mp4</a>	 
Trip	Having a good day? Don't let a trip spoil it.	<a href="#">N11_Good_day_dont_let_a_trip_spoil_it.mp3</a>	<a href="#">L11 Watch</a>	 



# Kings Cross



## Playlists

Playlist	New
Default Playlist	 
Early	 
AM Peak	 
Interpeak	 
PM Peak	 
Late Evening	 
Night	 
OFF	 
TEST	 

Playlist Name

Message

Included



















Seconds between messages



# Kings Cross



## Playlists

Playlist	New
Default Playlist	 
Early	 
AM Peak	 
Interpeak	 
PM Peak	 
Late Evening	 
Night	 
OFF	 
TEST	 

Playlist Name

Seconds between messages

Message

Included

Luggage 1



Luggage 2



Luggage 3



Handrail



Children



Step



Unsteady



Forwards



Step On Off



Night Out Handrail



Trip



Night Out



Special Outing



Drink



Hurry



Late



OFF



# Kings Cross



## Schedule

Select Day:

- ✓ Monday
- Tuesday
- Wednesday
- Thursday
- Friday
- Saturday
- Sunday

#	Start			New
1	00:00		ing	 
2	00:45			 
3	05:30	07:00	Early	 
4	07:00	10:00	AM Peak	 
5	10:00	16:00	Interpeak	 
6	16:00	19:00	PM Peak	 
7	19:00	00:00	Late Evening	 

### Schedule Detail

Start time

12:30

End time

12:30

Minutes must be a quarter-hour (:00, :15, :30, :45)  
Please use '00:00' to indicate midnight.

Playlist

Default Playlist





# Kings Cross



## Annunciator - Esc-16

Annunciator Volume (10 - 100 %)



Filter: Comms

Filter: Tamper

Filter: All

Last Seen Date & Time:

07-Apr-2024 18:50:48

Time	Event
07-Apr-2024 18:50:48	[INFO] Playing playlist PM Peak, Please hold the handrail firmly.
07-Apr-2024 18:50:48	[INFO] Current Playlist ID: 5
07-Apr-2024 18:50:48	[INFO] Playing playlist PM Peak, Keep kids feet clear of the edges
07-Apr-2024 18:50:48	[INFO] Current Playlist ID: 5
07-Apr-2024 18:50:48	[INFO] Playing playlist PM Peak, Luggage? It's safer to take the lift
07-Apr-2024 18:50:48	[INFO] Current Playlist ID: 5
07-Apr-2024 18:50:48	[INFO] Playing playlist PM Peak, Please hold the handrail firmly.
07-Apr-2024 18:50:48	[INFO] Current Playlist ID: 5
07-Apr-2024 18:50:48	[INFO] Playing playlist PM Peak, Keep kids feet clear of the edges
07-Apr-2024 18:50:48	[INFO] Current Playlist ID: 5
07-Apr-2024 18:50:48	[INFO] Playing playlist PM Peak, Luggage? It's safer to take the lift
07-Apr-2024 18:50:48	[INFO] Current Playlist ID: 5
07-Apr-2024 18:50:48	[INFO] Playing playlist PM Peak, Please hold the handrail firmly.
07-Apr-2024 18:50:48	[INFO] Current Playlist ID: 5
07-Apr-2024 18:50:48	[INFO] Playing playlist PM Peak, Keep kids feet clear of the edges
07-Apr-2024 18:50:48	[INFO] Current Playlist ID: 5

Services

AnnunciatorService

Av Files

Property Sheet

01 Luggage.mp4

Eas Av File

File Name

01 Luggage .mp4

File Type

MP4

Last Modified

14-Jul-2023 04:39:58.000 PM BST

Check Sum

01tYzFyY+e+agDzeHCuurw==

File Missing

☒ false

01\_Take\_extra\_care\_with\_luggage\_and\_heavy\_bags.mp3

Eas Av File

02 Luggage Lift.mp4

Eas Av File

02\_Luggage\_its\_safer\_to\_take\_the\_lift.mp3

Eas Av File

03 Heavy Luggage.mp4

Eas Av File

03\_No\_heavy\_luggage\_please\_use\_the\_lift.mp3

Eas Av File

04 Handrail.mp4

Eas Av File

04\_Please\_hold\_the\_handrail\_firmly.mp3

Eas Av File

05 Children.mp4

Eas Av File

05\_Take\_extra\_care\_with\_children.mp3

Eas Av File

06 Watch Your Step.mp4

Eas Av File

06\_Watch\_your\_step.mp3

Eas Av File

07\_A\_bit\_unsteady\_Take\_extra\_care.mp3

Eas Av File

08\_Face\_forwards\_and\_hold\_the\_handrail.mp3

Eas Av File

09\_Be\_careful\_when\_you\_step\_on\_and\_off\_the\_escalator.mp3

Eas Av File

10\_Good\_night\_out\_Hold\_the\_handrail.mp3

Eas Av File

11 Watch Your Step Trip.mp4

Eas Av File

11\_Having\_a\_good\_day\_dont\_let\_a\_trip\_spoil\_it.mp3

Eas Av File

12\_Night\_out\_Dont\_let\_a\_fall\_spoil\_the\_fun.mp3

Eas Av File

13\_Important\_journey\_today\_Dont\_let\_a\_trip\_spoil\_it.mp3

Eas Av File

14\_Had\_a\_drink\_be\_extra\_careful\_on\_the\_escalator.mp3

Eas Av File

15\_In\_a\_hurry\_Always\_look\_where\_youre\_going.mp3

Eas Av File

16\_Running\_late\_please\_watch\_your\_step.mp3

Eas Av File

17\_annunciator\_kids.mp3

Eas Av File

L01 Luggage.mp4

Eas Av File

File Name

L01 Luggage .mp4

File Type

MP4

Last Modified

19-Jan-2024 09:26:00.000 AM GMT

Check Sum

XC6w5QBRudbb6w0TK1G1LQ==

File Missing

☒ false

L02 Luggage Lift.mp4

Eas Av File

Message Instances				
#	Friendly Name	Text	Audio File	Video File
1	Luggage 1	Take extra care with luggage and heavy bags.	01_Take_extra_care_with_luggage_and_heavy_bags.mp3	L01 Luggage.mp4
2	Luggage 2	Luggage? It's safer to take the lift	02_Luggage_its_safer_to_take_the_lift.mp3	L02 Luggage Lift.mp4
3	Luggage 3	No heavy luggage, please use the lift	03_No_heavy_luggage_please_use_the_lift.mp3	L03 Heavy Luggage.mp4
4	Handrail	Please hold the handrail firmly.	04_Please_hold_the_handrail_firmly.mp3	L04 Handrail.mp4
5	Children	Take extra care with children	05_Take_extra_care_with_children.mp3	L05 Children.mp4
6	Step	Watch your step	06_Watch_your_step.mp3	L06 Watch Your Step.mp4
7	Unsteady	A bit unsteady? Take extra care.	07_A_bit_unsteady_Take_extra_care.mp3	L04 Handrail.mp4
8	Forwards	Face forwards and hold the handrail.	08_Face_forwards_and_hold_the_handrail.mp3	L04 Handrail.mp4
9	Step On Off	Be careful when you step on and off the escalator.	09_Be_careful_when_you_step_on_and_off_the_escalator.mp3	L04 Handrail.mp4
10	Night Out Handrail	Good night out? Hold the handrail.	10_Good_night_out_Hold_the_handrail.mp3	L04 Handrail.mp4
11	Trip	Having a good day? Don't let a trip spoil it.	11_Having_a_good_day_dont_let_a_trip_spoil_it.mp3	L11 Watch Your Step Trip.mp4
12	Night Out	Night out? Don't let a fall spoil the fun.	12_Night_out_Dont_let_a_fall_spoil_the_fun.mp3	L06 Watch Your Step.mp4
13	Special Outing	Important journey today? Don't let a trip spoil it.	13_Important_journey_today_Dont_let_a_trip_spoil_it.mp3	L04 Handrail.mp4
14	Drink	Had a drink? Be extra careful on the escalator.	14_Had_a_drink_be_extra_careful_on_the_escalator.mp3	L04 Handrail.mp4
15	Hurry	In a hurry. Always look where you're going.	15_In_a_hurry_Always_look_where_youre_going.mp3	L06 Watch Your Step.mp4
16	Late	Running late. Please watch your step.	16_Running_late_please_watch_your_step.mp3	L11 Watch Your Step Trip.mp4
17	OFF	OFF	01_Take_extra_care_with_luggage_and_heavy_bags.mp3	L01 Luggage.mp4
18	Children edges	Keep kids feet clear of the edges	17_annunciator_kids.mp3	L06 Watch Your Step.mp4







No heavy luggage

STOP

STOP

Hold the Handrail

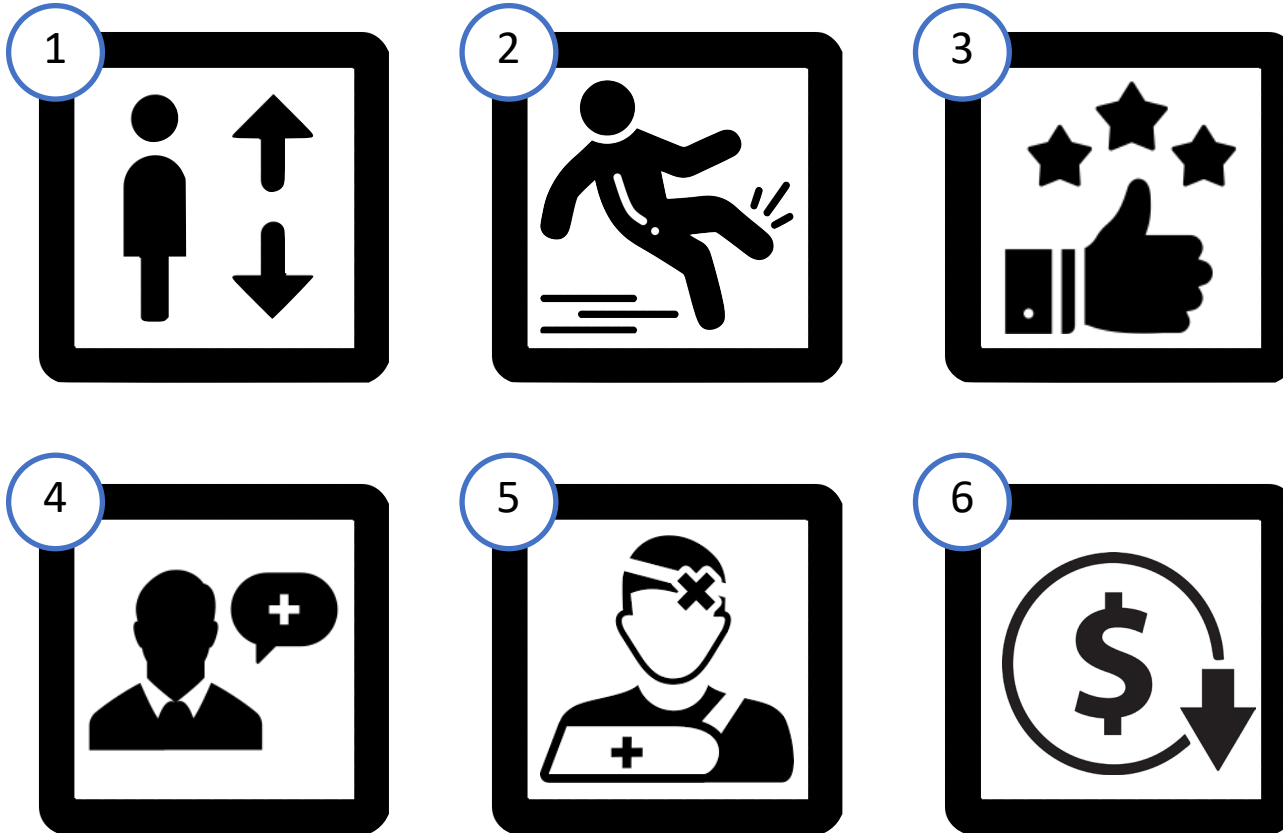
CAUTION

Hold the Handrail

CAUTION

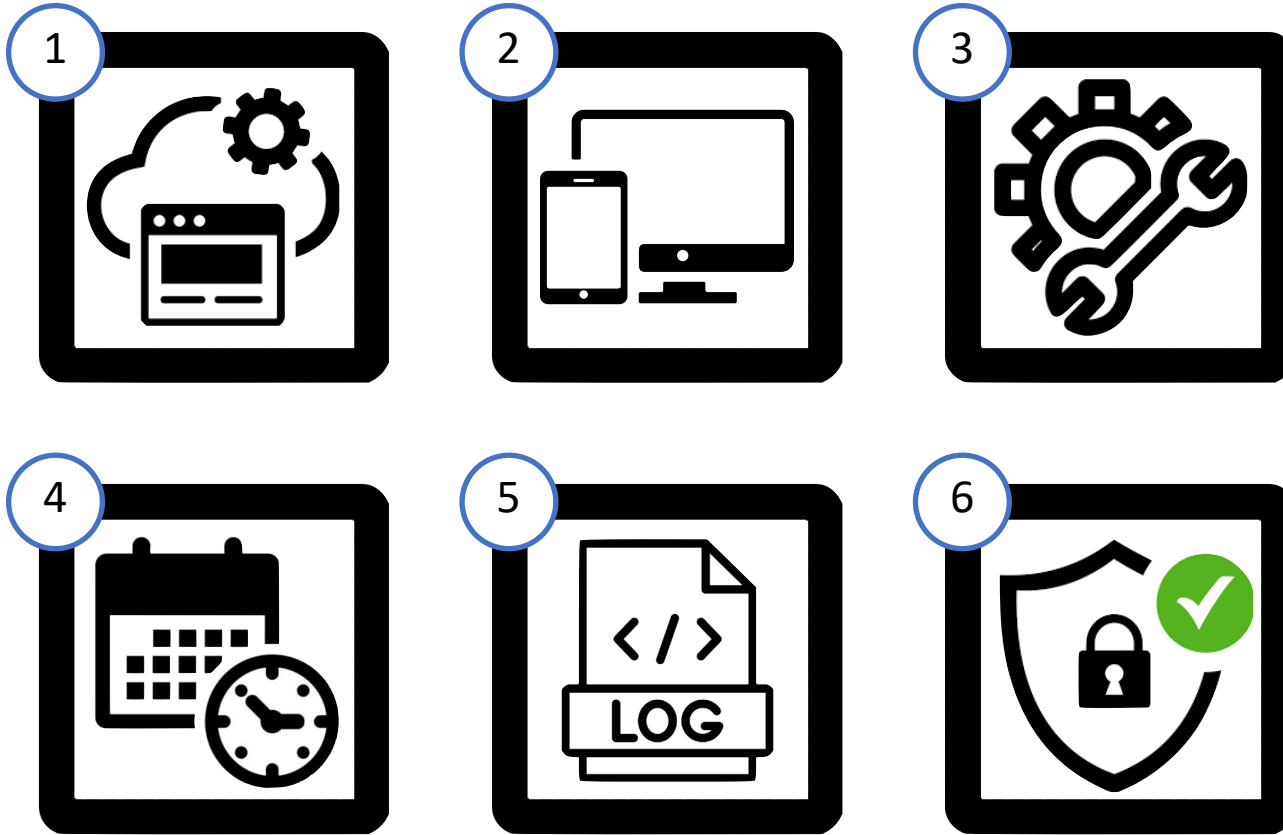


# The Results...



**NS2024**  
APRIL 15 - 17 | ANAHEIM, CA

# The blessings of Niagara 4...



**NS2024**  
APRIL 15 - 17 | ANAHEIM, CA



# GET IN TOUCH TODAY

TRIDIUM



*Email:*  
**[ged.tyrrell@tbt.group](mailto:ged.tyrrell@tbt.group)**

*Mobile:* **+447779 712538**

*Web:* **[www.tbt.group](http://www.tbt.group)**



**NS2024**   
APRIL 15 - 17 | ANAHEIM, CA



# Thank you!

- Gary Ament – FSG Smart Buildings [gary.ament@fsgi.com](mailto:gary.ament@fsgi.com)
- Mark Tubinis – Veea [mark.tubinis@veea.com](mailto:mark.tubinis@veea.com)
- Ged Tyrrell – Tyrrell Products Ltd  
[ged.tyrrell@tyrrellproducts.com](mailto:ged.tyrrell@tyrrellproducts.com)

