

# **Appendix A:**

## **Pilot Site Summary Details**

**A1. Pilot Site Summary Details (1 of 2)**

Vendor Name	TAPCO	FLIR	SICK	Conduent
Vendor Address	5100 W. Brown Deer Rd, Milwaukee, WI 53223	27700 SW Parkway Ave, Wilsonville, OR 97070	6900 W. 110 <sup>th</sup> St Minneapolis, MN 55438	100 Campus Dr #200 Florham Park, NJ 07932
Vendor Website	<a href="http://www.tapconet.com">www.tapconet.com</a>	<a href="http://www.flir.com">www.flir.com</a>	<a href="http://www.sick.com">www.sick.com</a>	<a href="http://www.conduent.com">www.conduent.com</a>
Site Location	Davis Drive Off-ramp	Davis Drive Off-ramp	NC-54 Off-ramp	T17/T18 Toll Zone
Maintenance Agreement?	No	No	No	No
Date of Commissioning	February 2018	July 2018	October 2018	March 2018
Date of Decommission	N/A	N/A	N/A	N/A
Detection Type	Microwave Radar	Thermal	Radar Sensor	Toll System Loops
Detection Equipment	ADEC TDC4	TrafiSense 2	SICK AOS301	IDRIS
Camera(s)	Optical (3) Axis Q1765-LE w/IR Illumination	Thermal (2) TrafiSense 2	-	Toll System Camera
Signs	Actuated Flashing LED Beacons (4)	-	-	Actuated Flashing RRFB Sign (2)
Notification Type(s)	Software Alert Email (with image/video)	Software Alert	Text Email	Email
Software	BlinkLink	Flux	TEMS Manager	-
Features	Resolve Prior Events Reporting Capability Event Logging Capability	Audible Alert Live Video Capability Reporting Capability	-	-

**A2. Pilot Site Summary Details (2 of 2)**

Vendor Name	TraffiCalm	MH Corbin	TransCore
Vendor Address	5676 E. Seltice Way Post Falls, ID 83854	621 Hutton St Raleigh, NC 27606	150 4 <sup>th</sup> Avenue North, Suite 1200 Nashville, TN 37219
Vendor Website	<a href="http://www.trafficalm.com">www.trafficalm.com</a>	<a href="http://www.mhcorbin.com">www.mhcorbin.com</a>	<a href="http://www.transcore.com">www.transcore.com</a>
Site Description	South Salem Street Off-ramp	Green Level West Road Off-ramp	M01/M13/M14 Toll Zone
Maintenance Agreement?	No	No	Yes
Date of Commissioning	February 2018	April 2020	June 2019
Date of Decommission	N/A	May 2020	N/A
Detection Type	Microwave Radar	LIDAR	Toll System Loops
Detection Equipment	<specific model not known>	Cepton Vista P60	Infinity
Camera(s)	Optical (3) Sigura BL820M1IR With IR Illumination	Thermal (1) Bosch Mic9000i	Toll System Camera
Signs	Actuated Backlit Flashing LED (4)	-	Actuated Flashing RRFB Sign (2)
Notification Type(s)	Software Alert Email (with video)	Cloud Alert Text Email	Software Alert (with video) Email
Software	Glance	Metiri Cloud-Based Dashboard	Client Utility Alert
Features	Audio Alert Limited Event Logging Capability	Annunciator	Audible Alert Visual Alert

**Appendix B:**  
**Davis Drive Off-ramp**  
**Pilot Site**

**B1. Pilot Site Overview**

<p><b>TRAFFIC SIGNAL, PAVEMENT MARKINGS &amp; SIGNING</b></p>	<p><b>1 Enhanced Traffic Signal Heads</b> Traffic signal heads now display green directional arrows to indicate "no turns".</p>  <p>Old Traffic Signal Heads      New Traffic Signal Heads</p>	<p><b>2 Enhanced Pavement Markings</b> Wider pavement markings increase the ramp intersection visibility and reinforce the prohibited traffic movement.</p> 	<p><b>3 New Enhanced Signs</b> Oversized static signs reinforce prohibited traffic moves.</p> 	
<p><b>ROADSIDE TECHNOLOGY</b></p>	<p><b>4 Radar Detection</b> Detects vehicles driving in the wrong direction on the off-ramp.</p> 	<p><b>5 Wrong-Way Electronic Signs</b> Once a wrong-way vehicle is detected by radar, red flashing lights are activated to alert the driver.</p> 	<p><b>6 Incoming/Outgoing Cameras</b> Two-directional cameras provide real-time wrong-way driving verification information to Turnpike Authority Traffic Management Center operators.</p> 	<p><b>7 Verification/Confirmation Camera</b> If the driver does not correct their direction of travel on the ramp, this camera provides verification of continued wrong-way driving on the Expressway.</p> 
				

### B2. Front Warning Sign Poles with Antenna



### B3. Front Warning Sign Pole with Antenna (Front/Rear)



**B4. Rear Warning Sign Poles with Antenna**



**B5. Rear Warning Sign Pole with Antenna (Front/Rear)**



**B6. Double Camera Pole with Antennas**





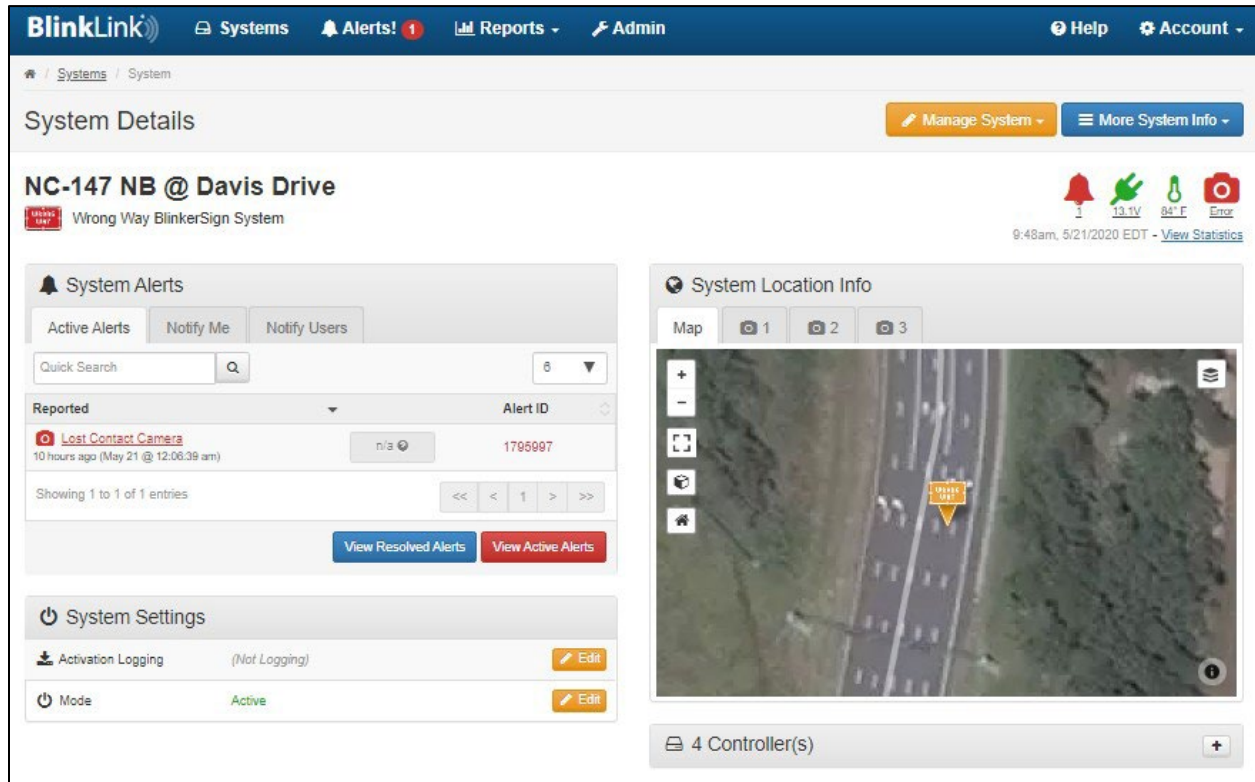
**B7. Tapco Detection on Gantry**



**B8. Tapco Detection on Gantry (Front/Rear)**



### B9. BlinkLink Software (System Details)



**BlinkLink** | Systems | Alerts! 1 | Reports | Admin | Help | Account

System Details | Manage System | More System Info

**NC-147 NB @ Davis Drive**  
Wrong Way BlinkerSign System

9:48am, 5/21/2020 EDT - View Statistics

**System Alerts**

Active Alerts | Notify Me | Notify Users

Quick Search [ ] [Q] 6

Reported [ ] Alert ID [ ]

Lost Contact Camera	n/a	1795997
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Showing 1 to 1 of 1 entries

View Resolved Alerts | View Active Alerts

**System Settings**

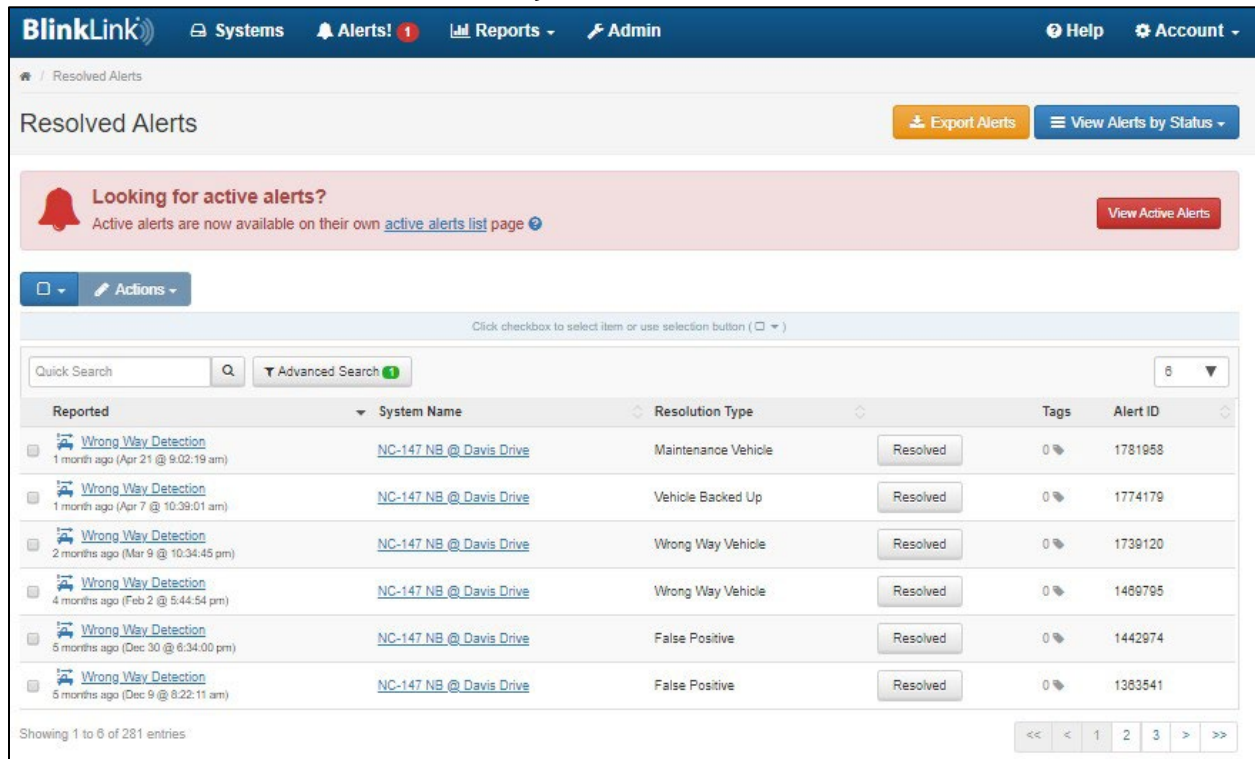
- Activation Logging (Not Logging) [Edit]
- Mode Active [Edit]

**System Location Info**

Map | 1 | 2 | 3

4 Controller(s)

### B10. BlinkLink Software (Event Log)



**BlinkLink** | Systems | Alerts! 1 | Reports | Admin | Help | Account

Resolved Alerts | Export Alerts | View Alerts by Status

Looking for active alerts?  
Active alerts are now available on their own [active alerts list page](#) [View Active Alerts]

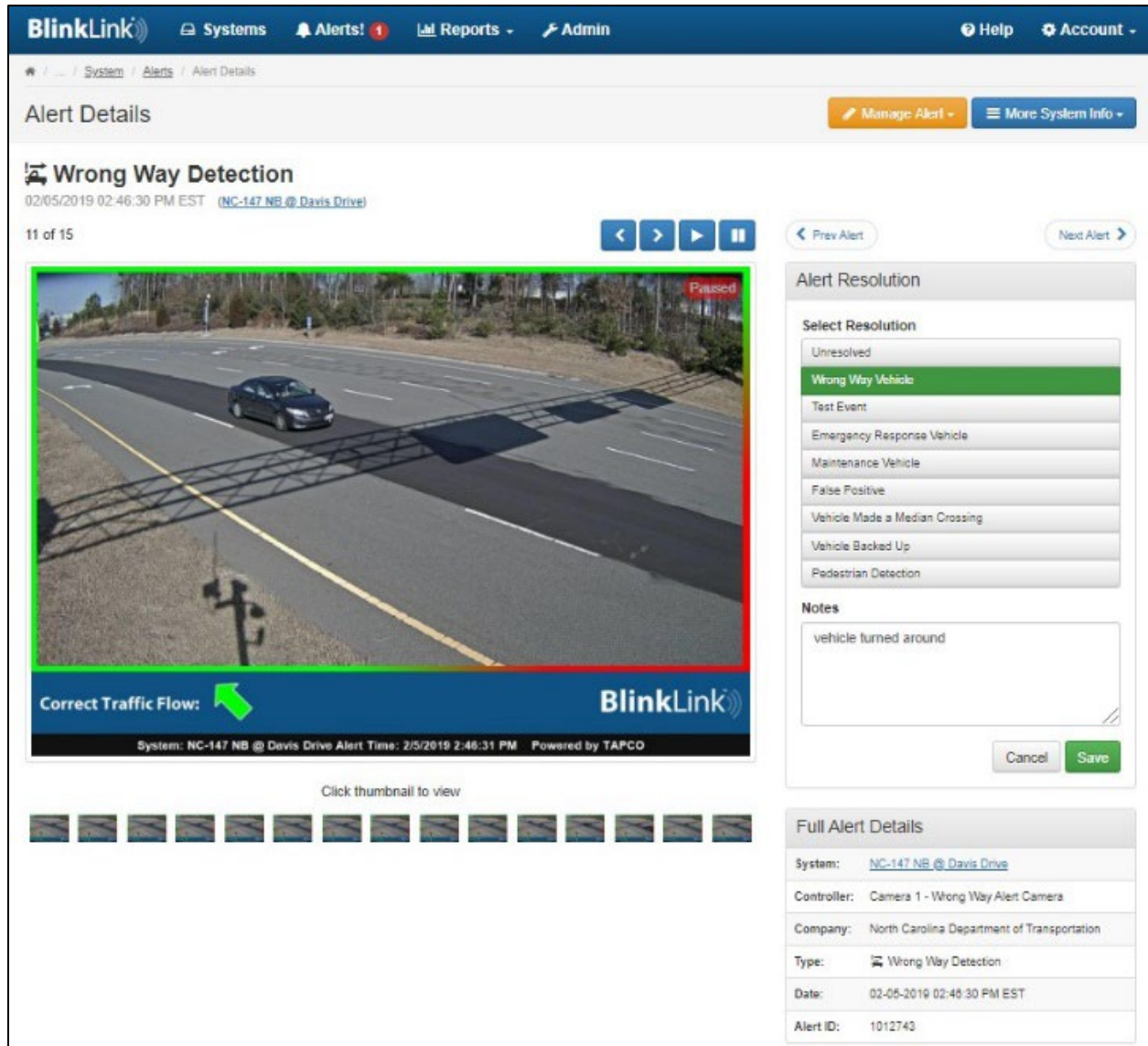
Actions [ ]

Quick Search [ ] [Q] [Advanced Search] 6

Reported	System Name	Resolution Type	Tags	Alert ID
Wrong Way Detection 1 month ago (Apr 21 @ 9:02:19 am)	NC-147 NB @ Davis Drive	Maintenance Vehicle	Resolved	1781958
Wrong Way Detection 1 month ago (Apr 7 @ 10:39:01 am)	NC-147 NB @ Davis Drive	Vehicle Backed Up	Resolved	1774179
Wrong Way Detection 2 months ago (Mar 9 @ 10:34:45 pm)	NC-147 NB @ Davis Drive	Wrong Way Vehicle	Resolved	1739120
Wrong Way Detection 4 months ago (Feb 2 @ 5:44:54 pm)	NC-147 NB @ Davis Drive	Wrong Way Vehicle	Resolved	1489795
Wrong Way Detection 5 months ago (Dec 30 @ 6:34:00 pm)	NC-147 NB @ Davis Drive	False Positive	Resolved	1442974
Wrong Way Detection 5 months ago (Dec 9 @ 8:22:11 am)	NC-147 NB @ Davis Drive	False Positive	Resolved	1383541

Showing 1 to 6 of 281 entries

### B11. BlinkLink Software (Event Details)



**BlinkLink** Systems Alerts! Reports Admin Help Account

System Alerts Alert Details

Alert Details Manage Alert More System Info

**Wrong Way Detection**  
02/05/2019 02:46:30 PM EST (NC-147 NB @ Davis Drive)

11 of 15 Prev Alert Next Alert

**Alert Resolution**

Select Resolution

- Unresolved
- Wrong Way Vehicle**
- Test Event
- Emergency Response Vehicle
- Maintenance Vehicle
- False Positive
- Vehicle Made a Median Crossing
- Vehicle Backed Up
- Pedestrian Detection

Notes

vehicle turned around

Cancel Save

**Full Alert Details**

System: NC-147 NB @ Davis Drive

Controller: Camera 1 - Wrong Way Alert Camera

Company: North Carolina Department of Transportation


Type: Wrong Way Detection

Date: 02-05-2019 02:46:30 PM EST

Alert ID: 1012743

### B12. BlinkLink Email Notification

BLINKLINK ALERT - Wrong Way Detection - For System Labeled NC-147 NB @ Davis Drive

 BlinkLink@blinklink.net  
To

Retention Policy 1 Year Full Mailbox (1 year) Expires 12/8/2020

Reply Reply All Forward More Mon 12/9/2019 8:22 AM

BlinkLink triggered a(n) Wrong Way Detection event for the following System.

Customer: North Carolina Department of Transportation  
System Details: NC-147 NB @ Davis Drive  
Asset Name: Camera 1 - Wrong Way Alert Camera  
Alert Time: 2019-12-09T13:22:11Z

Go to <http://www.blinklink.net/admin/alert/view/1363541> to view this notification in BlinkLink or <http://www.blinklink.net/admin/settings> to change your notification preferences.

Contact BlinkLink Support at 866-753-6255 or email to [blinkersupport@tapconet.com](mailto:blinkersupport@tapconet.com).

**B13. FLIR Camera/Detection on Gantry**



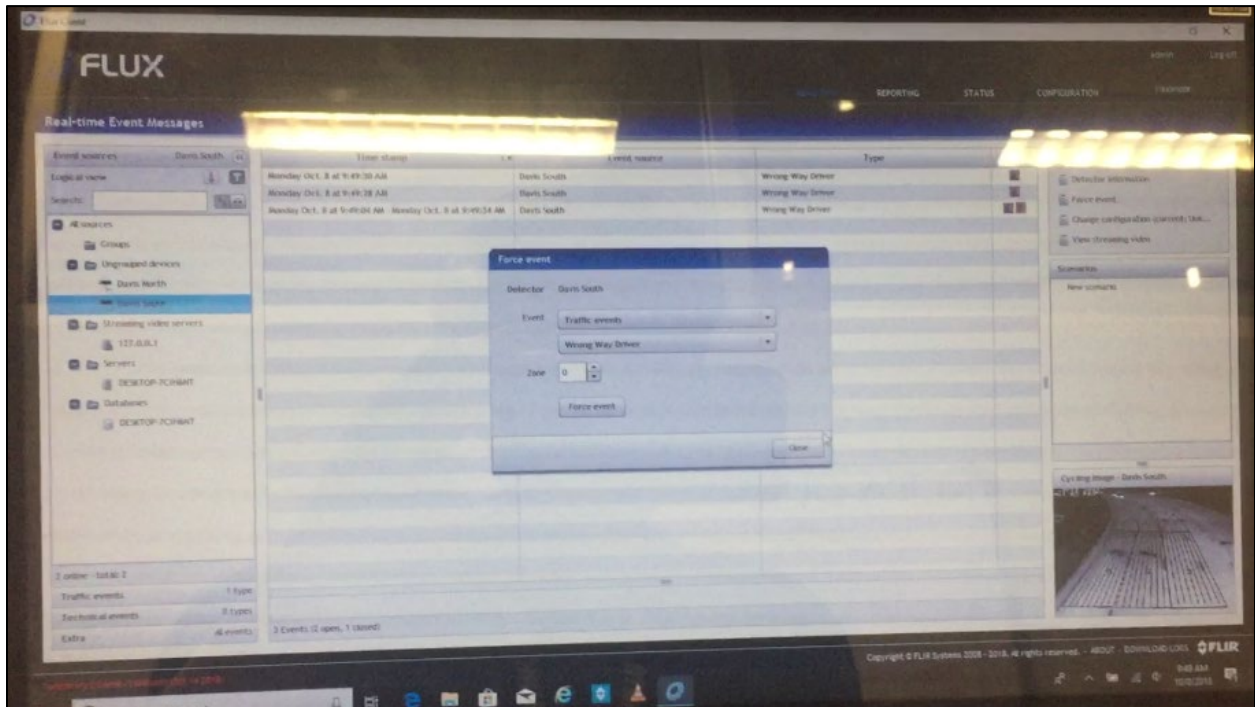
**B14. FLIR Camera/Detection on Gantry (Front/Rear)**



**B15. FLIR Thermal Detection**



## B16. Flux Software Interface (Event Log)



\*No longer have access to Flux software. Working on getting access restored or better screenshot from FLIR.

**B17. Enhanced Traffic Signal Heads at Ramp Intersection**



**B18. Enhanced Traffic Signs at Ramp Intersection**



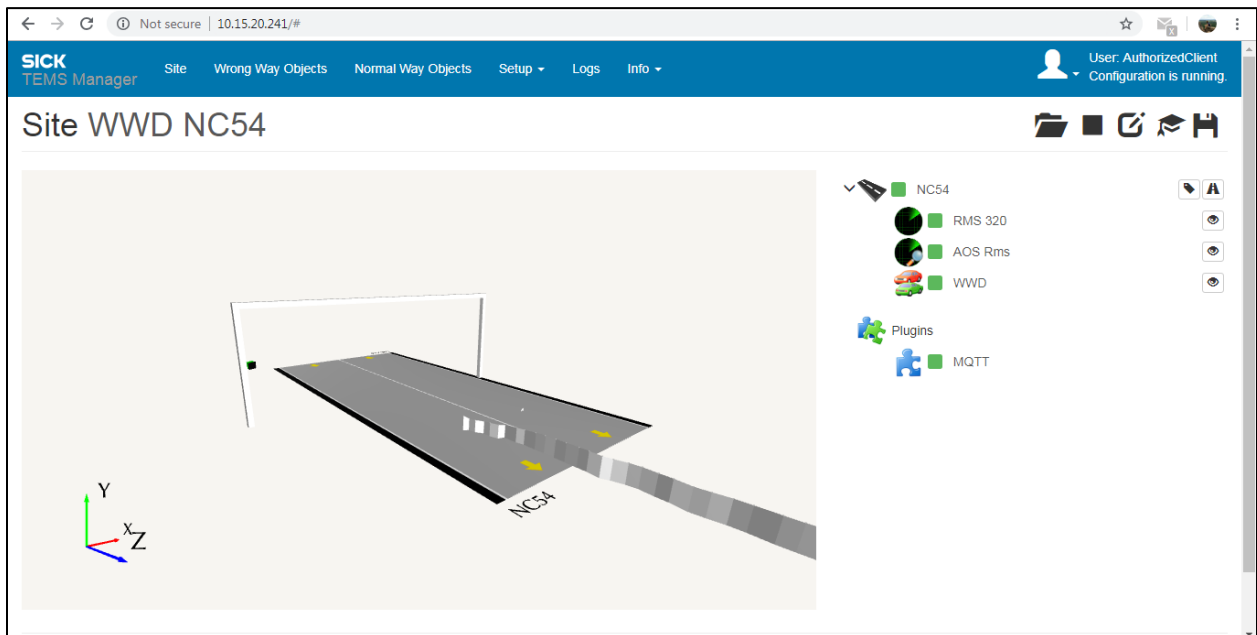
**Appendix C:**  
**NC-54 Off-ramp**  
**Pilot Site**



### C1. SICK Detection on Pole



### C2. SICK Web Browser Interface





**Appendix D:**  
**Toll NC-540 Mainline**  
**Pilot Site**

### D1. Pilot Site Overview

**ROADSIDE TECHNOLOGY**

**Wrong-Way Electronic Signs**  
Once a wrong-way vehicle is detected by toll system loops, red flashing lights are activated to alert the driver.


**1** 

**2** 

**Street View of Northbound Lanes**

**Street View of Southbound Lanes**

**TOLL**  
**540**



## D2. TrafficCalm Signs on Poles



## D3. TrafficCalm Sign on Pole (Front/Rear)



**D4. TAPCO Signs on Poles with Antenna**



**D5. TAPCO Sign on Pole with Antenna (Front/Rear)**

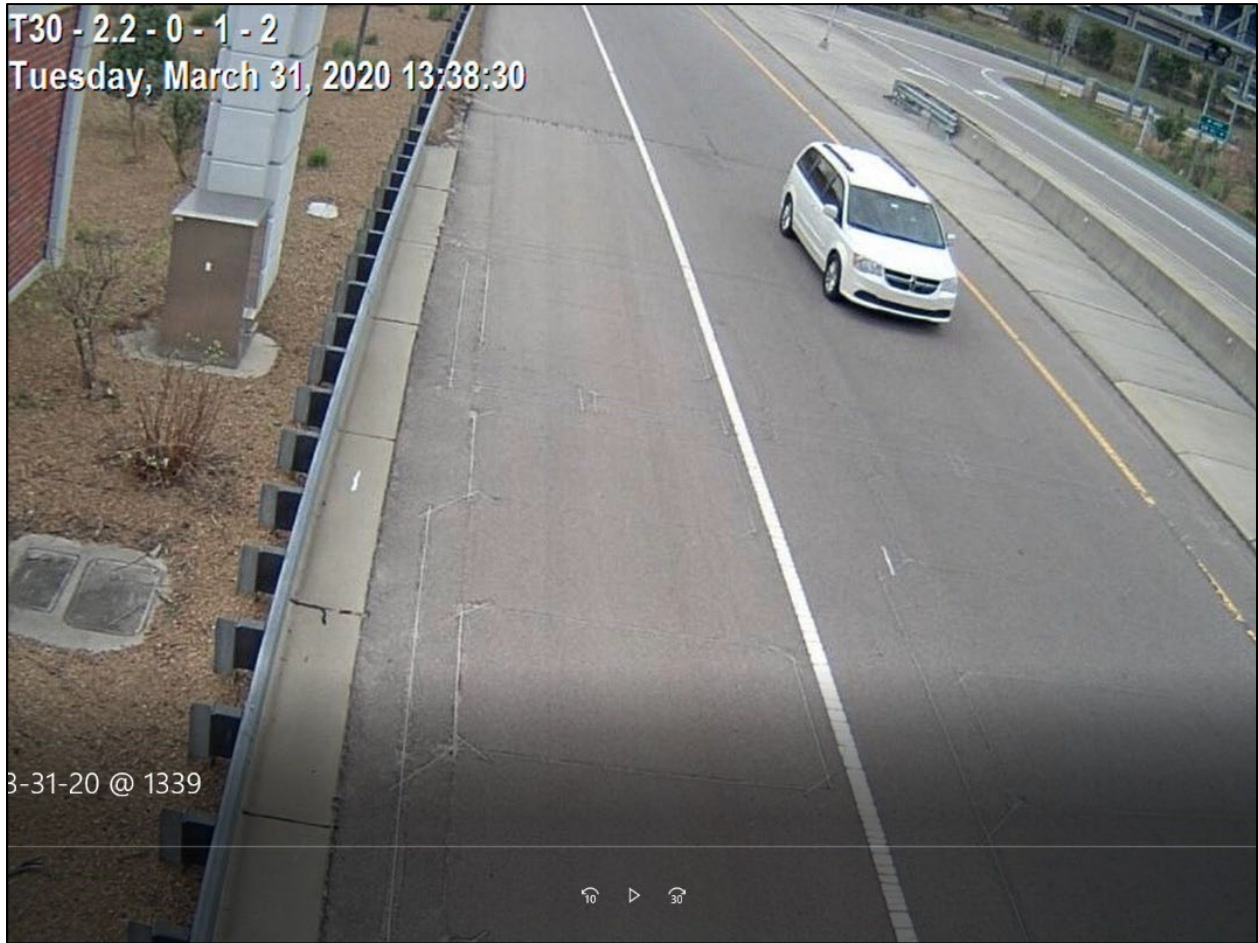


**D6. Antenna on Vault Building**



**D7. Toll System RVN Video Image**

T30 - 2.2 - 0 - 1 - 2  
Tuesday, March 31, 2020 13:38:30



**Appendix E:**  
**Green Level West Street Off-ramp**  
**Pilot Site**



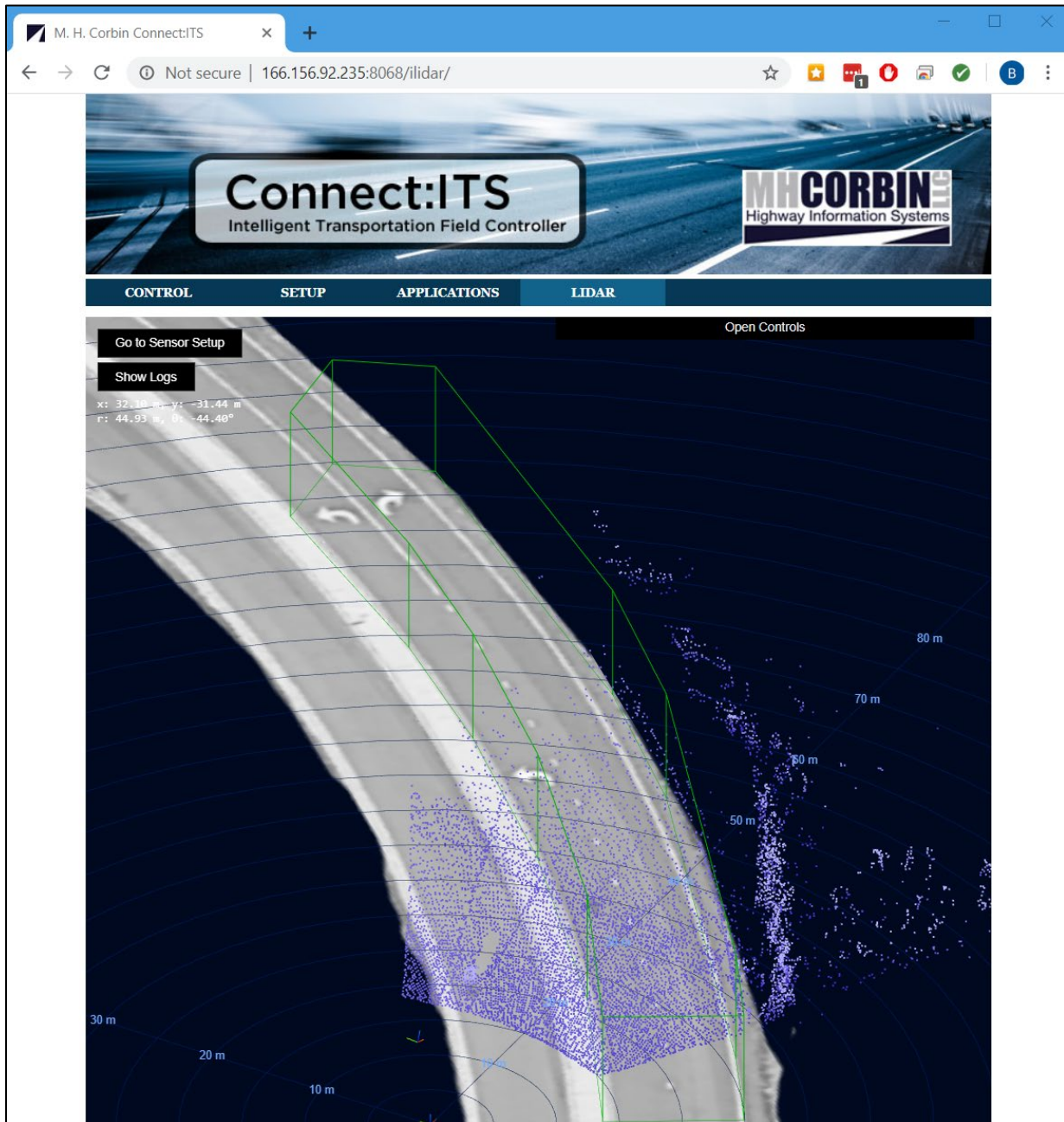
**E1. Initial Mobile Trailer Setup (LIDAR Detection and Thermal Camera)**



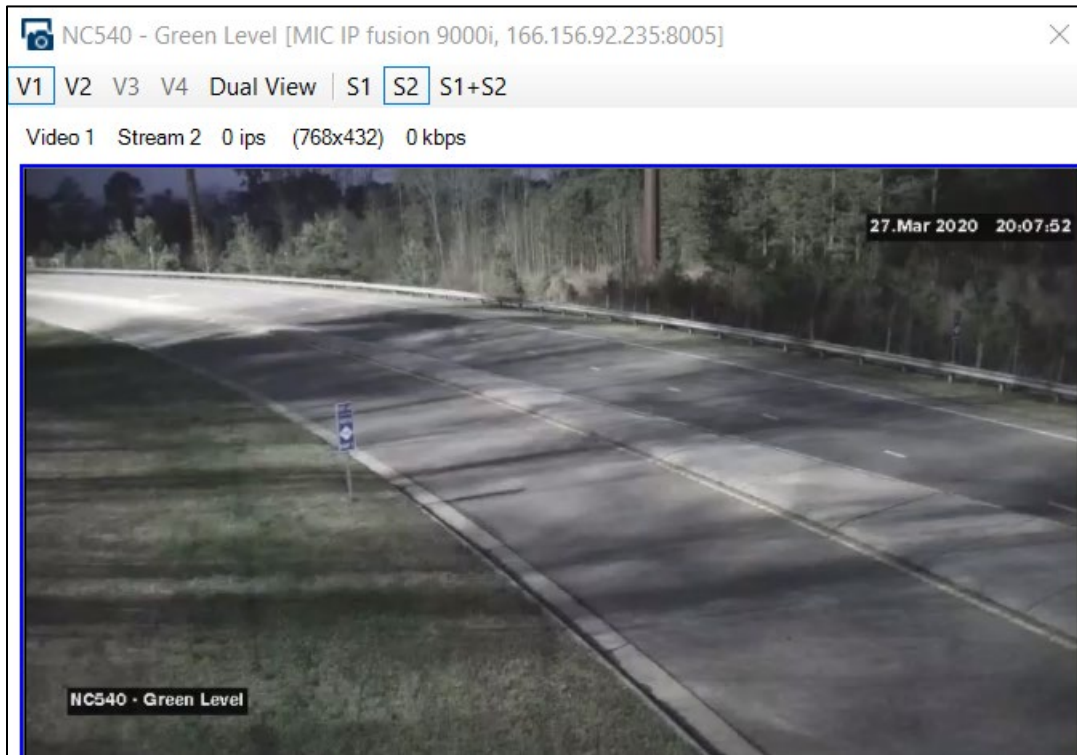
**E2. Revised Pole Mounted Setup (LIDAR Detection and Auto-Tracking Camera)**



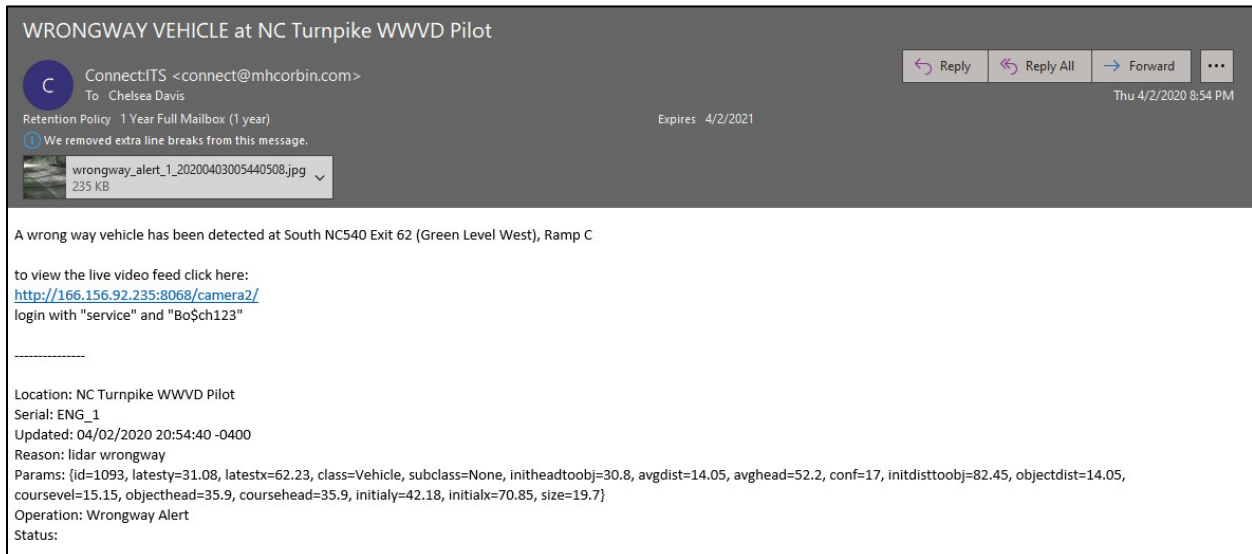
### E3. Cloud Software LIDAR Detection Zone



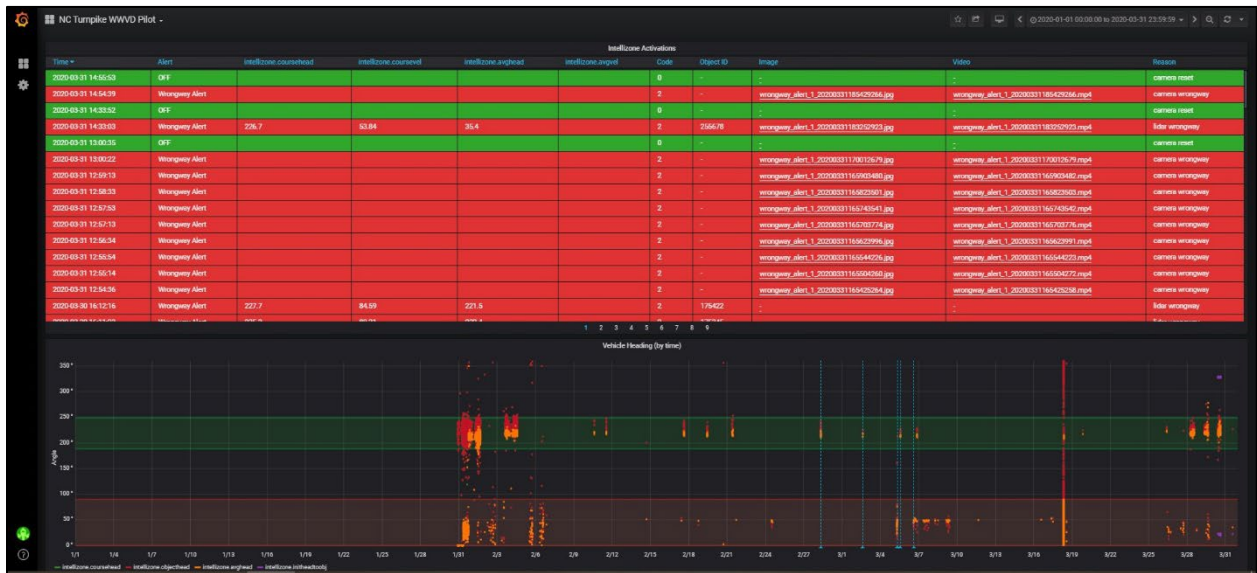
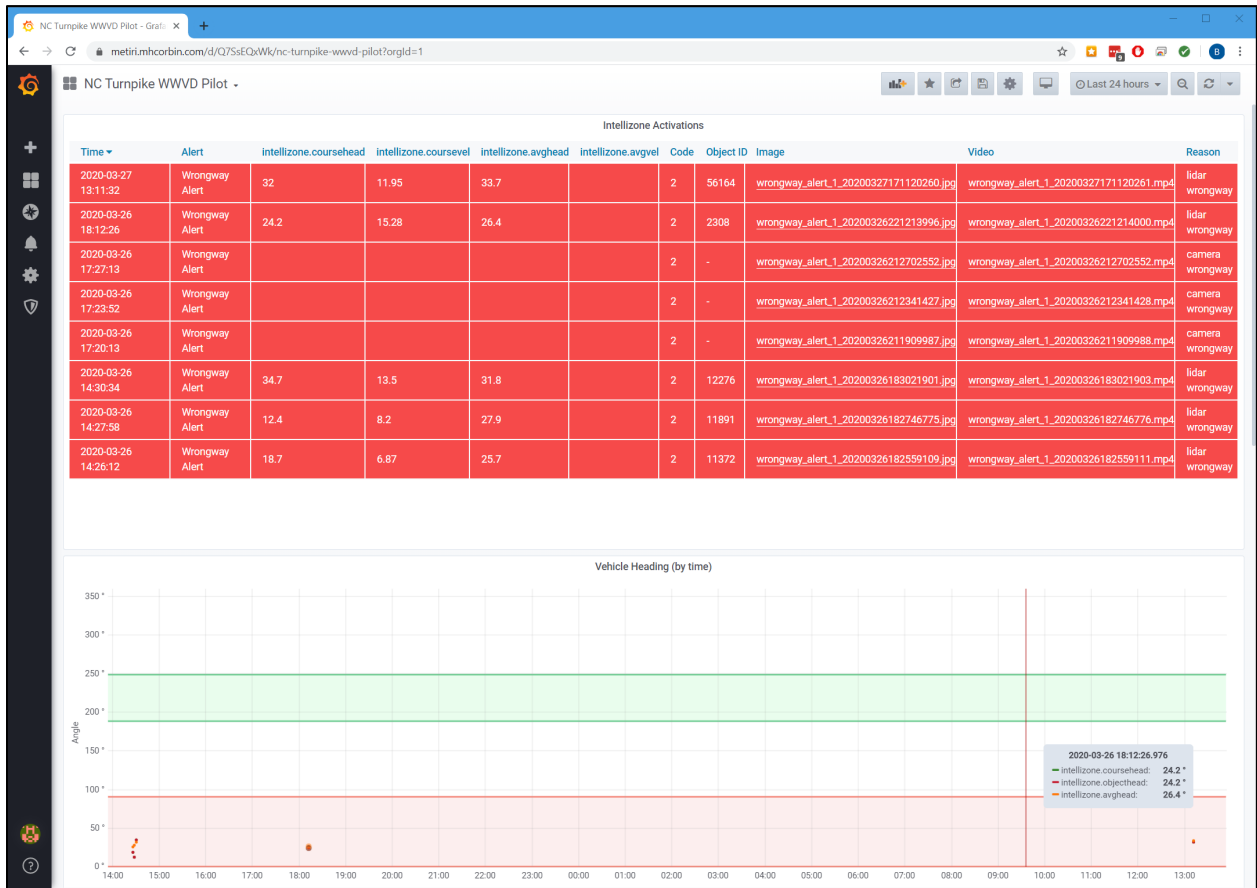
### E4. Cloud Software Live Video Camera Feed & Settings



### E5. Cloud Email Notification




**E6. Cloud Software Interface (Event Log)**



**Appendix F:**  
**South Salem Street Off-ramp**  
**Pilot Site**

**F1. Pilot Site Overview**

<p><b>TRAFFIC SIGNAL, PAVEMENT MARKINGS &amp; SIGNING</b></p> <p><b>1 Enhanced Pavement Markings</b> Wider pavement markings increase the ramp intersection visibility and reinforce the prohibited traffic movement.</p> 	<p><b>ROADSIDE TECHNOLOGY</b></p> <p><b>2 Radar Detection</b> Detects vehicles driving in the wrong direction on the off-ramp.</p>  <p><b>3 Wrong-Way Electronic Signs</b> Once a wrong-way vehicle is detected by radar, red flashing lights are activated to alert the driver.</p> 	<p><b>4 Incoming/Outgoing Cameras</b> Two-directional cameras provide real-time, wrong-way driving verification information to Turnpike Authority Traffic Management Center operators.</p>  <p><b>5 Verification/Confirmation Camera</b> If the driver does not correct their direction of travel on the ramp, this camera provides verification of continued wrong-way driving on the Expressway.</p> 
		

**F2. Front Sign Poles with Antenna**



**F3. Front Sign Pole with Antenna (Front/Rear)**





#### F4. Rear Sign Poles with Camera & Detection



**F5. Rear Sign Pole with Camera/Detection & Antenna (Front/Rear)**



**F6. Rear Sign Pole with Camera/Detection & Antenna (Front/Rear)**



**F7. Downstream Ramp Gore Camera Pole**



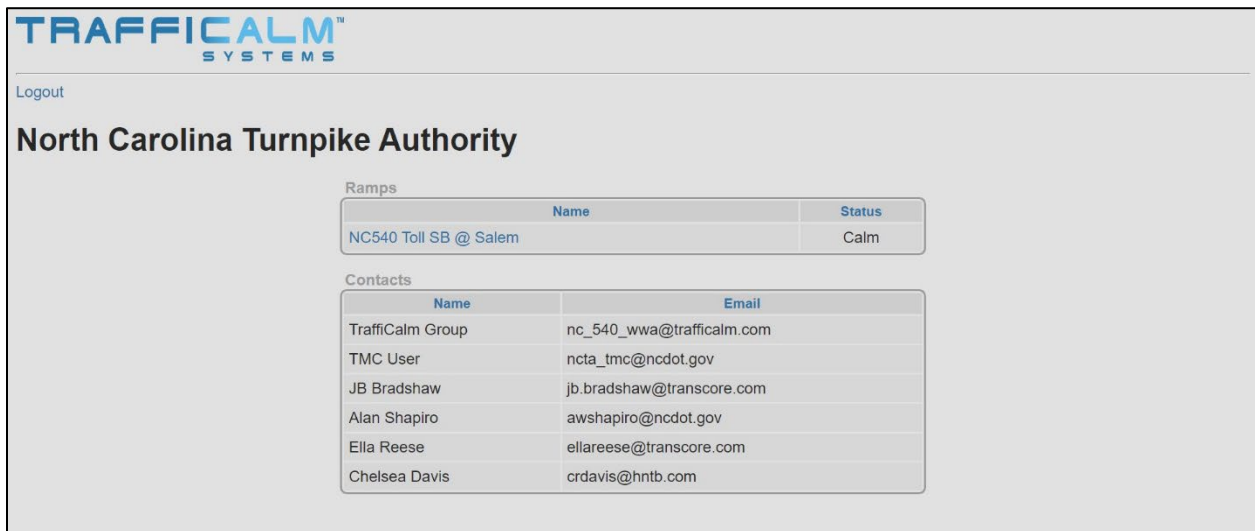
## F8. Glance Software Interface



**TRAFFICALM™**  
SYSTEMS

Email:

Password:



**TRAFFICALM™**  
SYSTEMS

Logout

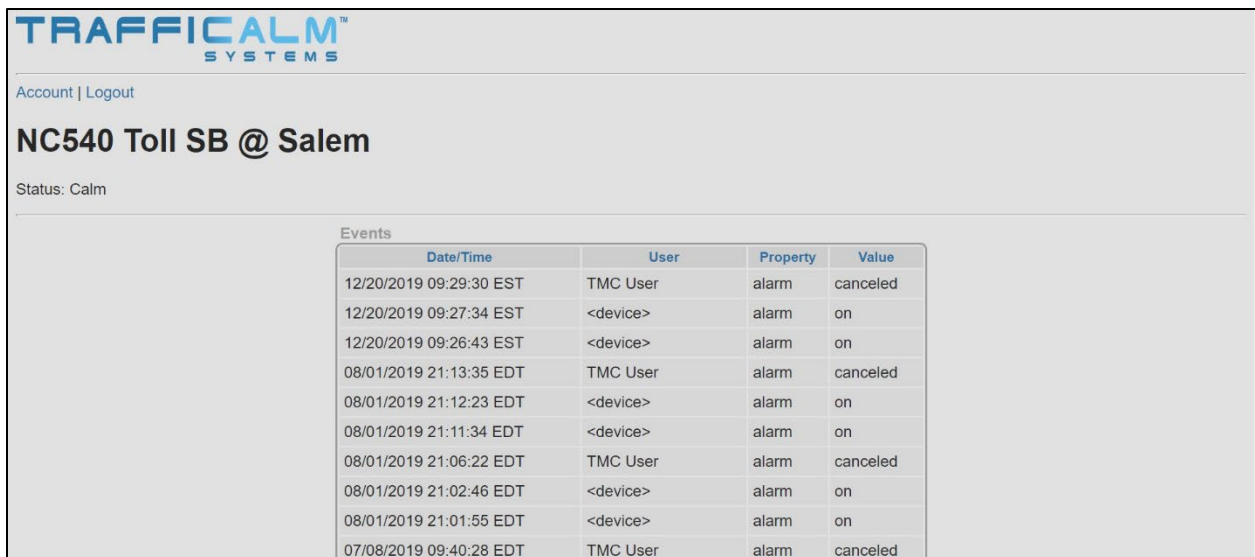
### North Carolina Turnpike Authority

Ramps

Name	Status
NC540 Toll SB @ Salem	Calm

Contacts

Name	Email
TraffiCalm Group	nc_540_wwa@trafficalm.com
TMC User	ncta_tmc@ncdot.gov
JB Bradshaw	jb.bradshaw@transcore.com
Alan Shapiro	awshapiro@ncdot.gov
Ella Reese	ellareese@transcore.com
Chelsea Davis	crdavis@hntb.com



**TRAFFICALM™**  
SYSTEMS

Account | Logout

### NC540 Toll SB @ Salem

Status: Calm

Events

Date/Time	User	Property	Value
12/20/2019 09:29:30 EST	TMC User	alarm	canceled
12/20/2019 09:27:34 EST	<device>	alarm	on
12/20/2019 09:26:43 EST	<device>	alarm	on
08/01/2019 21:13:35 EDT	TMC User	alarm	canceled
08/01/2019 21:12:23 EDT	<device>	alarm	on
08/01/2019 21:11:34 EDT	<device>	alarm	on
08/01/2019 21:06:22 EDT	TMC User	alarm	canceled
08/01/2019 21:02:46 EDT	<device>	alarm	on
08/01/2019 21:01:55 EDT	<device>	alarm	on
07/08/2019 09:40:28 EDT	TMC User	alarm	canceled

## F9. Glance Email Notification

Wrong Way Alert - NC540 Toll SB @ Salem



NO-REPLY <no-reply@trafficalm.com>

To Chelsea Davis

Retention Policy 1 Year Full Mailbox (1 year)

Expires 12/19/2020



overhead.mp4  
1 MB

**TRAFFICALM™**  
SYSTEMS

An alarm has been detected at NC540 Toll SB @ Salem. Please use the following URL to deactivate the alarm.

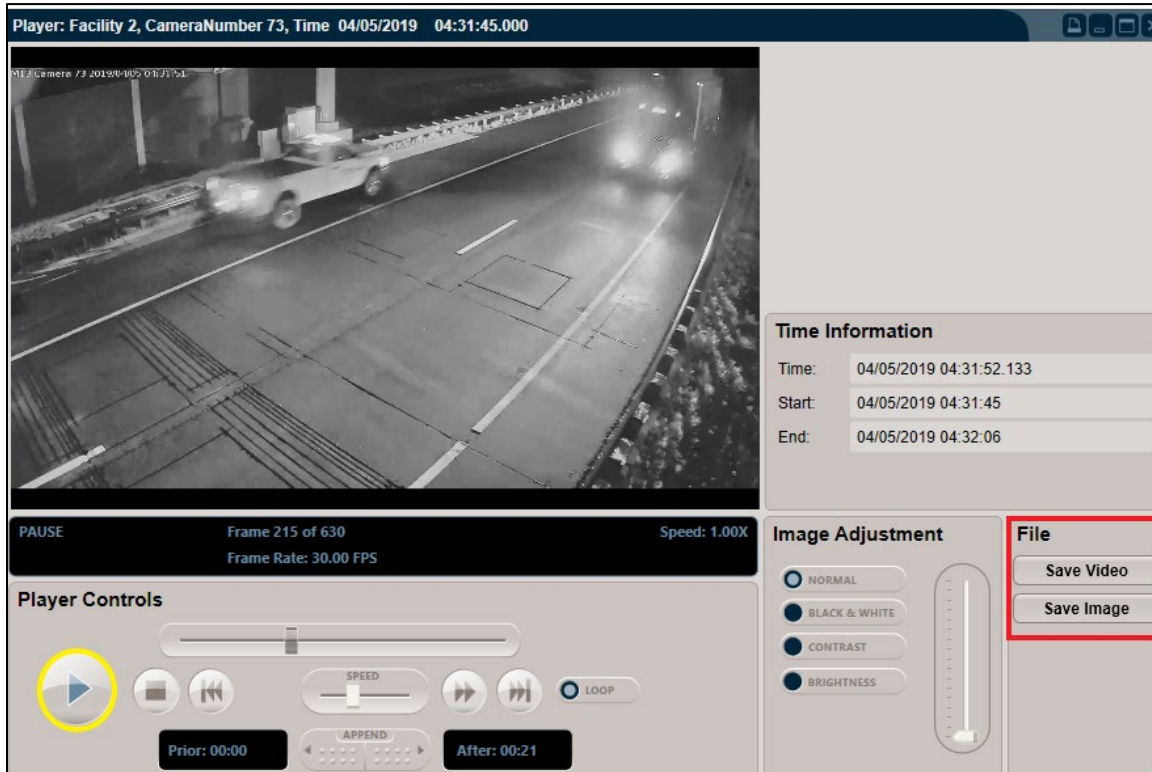
<http://bluesentry.trafficalm.com/ramp/42282a5e-8b8d-4e79-94af-1cfc4c9ce322>

**Appendix G:**  
**Toll US-74 Business Mainline**  
**Pilot Site**

**G1. TAPCO Sign Poles with Antenna**



**G2. Client Alert Utility Software (Event Details)**



**G3. Client Alert Utility Software (Alert)**

