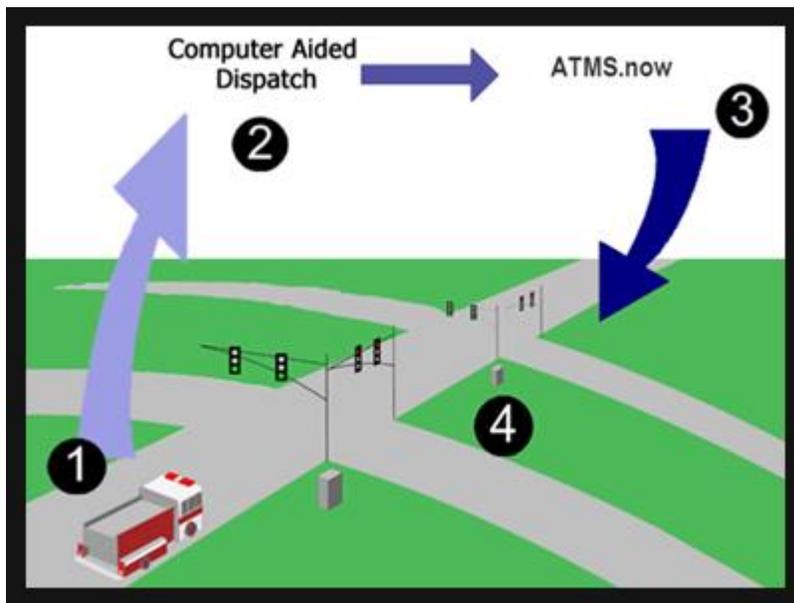


ATMS

Emergency Responder / Priority Setup and Documentation



February 2021

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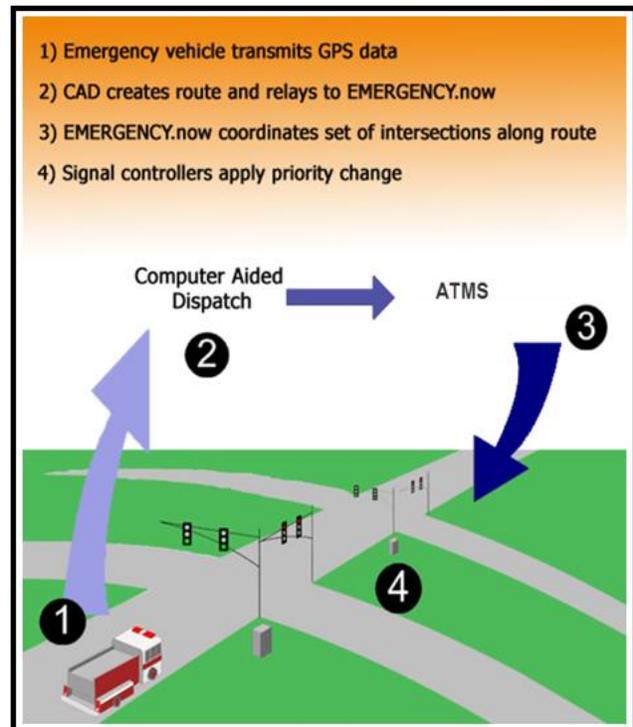
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Emergency Responder / Priority Overview

Studies have shown that emergency vehicle priority systems can reduce response times and improve emergency vehicle safety. Cubic | Trafficware. has developed central and local software that will assist emergency vehicles respond quickly to incidents under all traffic conditions. The result will enable reduced emergency response time and greater emergency vehicle safety, with minimal impact to surrounding traffic, at a lower cost of implementation than other available solutions.

As shown in the diagram below, the Emergency Responder /Vehicle Priority System will provide traffic flow priority to vehicles traversing a route between an origin and an incident. Traffic flow priority enables vehicles to move through signalized intersections under a green signal indication, thus eliminating delay time and safety hazards caused by moving through intersections under a red light.

Emergency Vehicle Priority **strives** to be in a green state prior to the Emergency Vehicle entering the intersection thereby creating a natural-feeling green signal indication for emergency vehicles. A green indication for emergency vehicles that appears normal and natural to all other traffic reduces the risk of accidents for all concerned. In addition, ATMS maintains coordinated traffic flow on roadways adjacent to the emergency route. This will minimize the impact to cross streets even as emergency vehicles experience green signals en route to an incident. As the traffic signal timing is dynamically adjusted, drivers on adjacent and oncoming roadways operate normally without disruption, and thus drivers will be less likely to interfere with emergency vehicles.



GPS units which are installed on emergency vehicles send vehicle location data to a central office. Dispatchers record incidents and generate routes for emergency vehicles to reach the scene. The Emergency/Priority module will communicate with both the GPS units and the central dispatch to coordinate traffic along the selected emergency route. Using the dispatched route information and the vehicle locations, ATMS will adjust the signal coordination in favor of the emergency vehicles. The result is fluid traffic movement for the emergency vehicles and a natural flow for all other traffic in the area.

Setup Considerations

Please insure that ATMS and your local intersection controller have the latest software with the Emergency/Priority software interface. Contact your Cubic | Trafficware representative for further details. The Emergency priority module is available on controllers utilizing V61.x, V76.x or Scout [V85.x] software.

Note: When operating the Emergency Responder / Priority software at an intersection, the controller programming for that intersection is limited to ONLY using 4 rings (Rings 1-4).

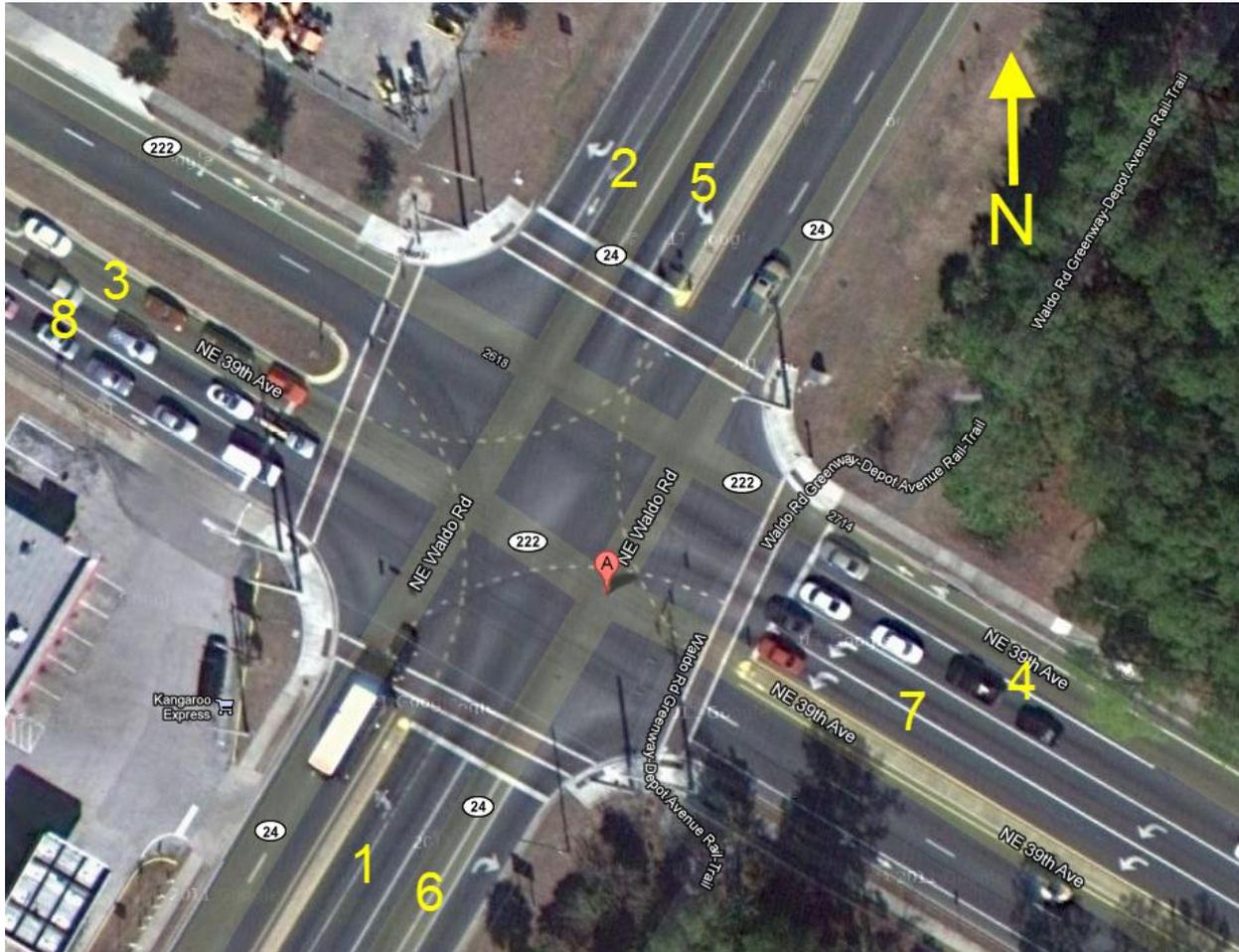
Emergency Responder utilizes GIS Mapping to plot the Computer Aided Dispatch (CAD) routes via GIS segments. The agency must have GIS mapping implemented in their ATMS system. In addition, the Vehicle must follow the dispatched route for this module to work as designed.

Mapping out your intersection

The Emergency/Priority module is based on central dispatch and routing. It is very important to map each individual intersection as per directions and phasing. Below is an example intersection.



Map out the Phasing for each approach. Make sure you map out the directions because the entries are based on directionality.



Based on this diagram, Phases 1 and 6 are Northbound, 2 and 5 are Southbound, 3 and 8 are Eastbound and 4 and 7 are Westbound.

Central programming for Emergency/Priority

The ATMS central system must be set up to allow Emergency/Priority service to particular intersections. This programming is done via the **Emergency Responder** Module.

- 1) For Emergency Responder system set-up, choose the **AVL** Module. Under Actions select **Controllers Online**.

The screenshot displays the ATMS Client v2.9.2.0-5.10.0.5500 interface. The 'AVL' menu item is circled in red, and a red arrow points to the 'Controllers Online' option within the AVL menu. Below the menu is a 'Vehicle List' section with a table that is currently empty. At the bottom, the 'Recent Alarms' section shows a table with one record.

Field Chooser	ID	Name	Drop	Status	#	Description	Date/Time	Data
<input type="checkbox"/> Check All <input type="checkbox"/> Clear All	101	Test V76 2070-Enet Id 101	101	Off	61	Coord in Transition	2/7/2020 9:58 AM	

Navigation buttons at the bottom include: Recent Alarms, Alarm History, System Notes, Current Users, Incident Trigger, Daktronics, CAD Incidents, Adaptive, Current Alarms, and Trip Logs.

2) Set Up all controllers that will Interface to the Emergency/Priority module

ATMS Client v2.9.2.0-5.10.0.5500 : ATMS.Now System / naztec@localhost (licensed to AIDemoLaptop)

Home Definitions AVL SynchroGreen Reports Connected Vehicle High-Res Help

List Vehicles Delete Vehicle List Vehicle Triggers Delete Vehicle Trigger **Controllers Online**
 Create Vehicle Create Vehicle Trigger AVL Parser
 Edit Vehicle Edit Vehicle Trigger

Vehicle Vehicle Triggers Virtual Priority

Virtual Controller Online

Online List

Currently Assigned

ID	Name
101	Test V76 2070-Enet Id 101
102	Test V76 2070 Enet Id 102
501	MSHA - MD 2 at 11th
502	MSHA -MD 2 at 16th
503	MSHA MD 2 at Church
504	MSHA MD2 at Hammonds
506	MSHA Signal Ahead signs
534	Md 648/2(Robinson Rd) @ Whites Rd.
535	Md648/2 at Robinson Rd- orig
536	Md 648/2 (Robinson Rd) @ Cypress Creel
537	Md 648/2 (Robinson Rd) @ Jones Station Rd
538	Md 648/2 (Robinson Rd) @ Arnold Rd
539	Md 648/2 (Robinson Rd) @ Md 10 Ramp
540	Md 648/2 (Robinson Rd) @ Pasadena Blvd
541	Md 648/2 (Robinson Rd) @ McKinsey Rd
542	Md 648/2 (Robinson Rd) @ W Campus
543	Md 648/2 (Robinson Rd) @ Earleigh Heights
544	Md 648/2 (Robinson Rd) @ College Pkway

← Add
Remove →

← Add All
Remove All →

ID	Name
312	vcTest 2
808	Chronomax Test
1015	WYDOT Grand and Vista Drive- 1015
1016	WYDOT Grand and Boulder Drive- 1016
1017	WYDOT Grand and 30th - 1017
1018	WYDOT Grand and 24th - 1018
1019	WYDOT Grand and 22nd
1020	WYDOT Grand and 19th
1021	WYDOT Grand and 17th
1022	WYDOT Grand and 15th
1505	Garfield @ 25th
3059	Paseo Del Norte @ Car Country
4176	Miami-NW 58th street at NW 79th Ave
4315	Miami-NW 58th street at NW 72nd Ave
4501	Miami-NW 58th street at SR 826 North
4502	Miami-NW 58th street at SR 826 South
4596	Miami-NW 58th street at NW 87th Ave
5005	San Marcos CA: Mission Rd at Las Posas

Recent Alarms

Setup Preview Print Export Clear

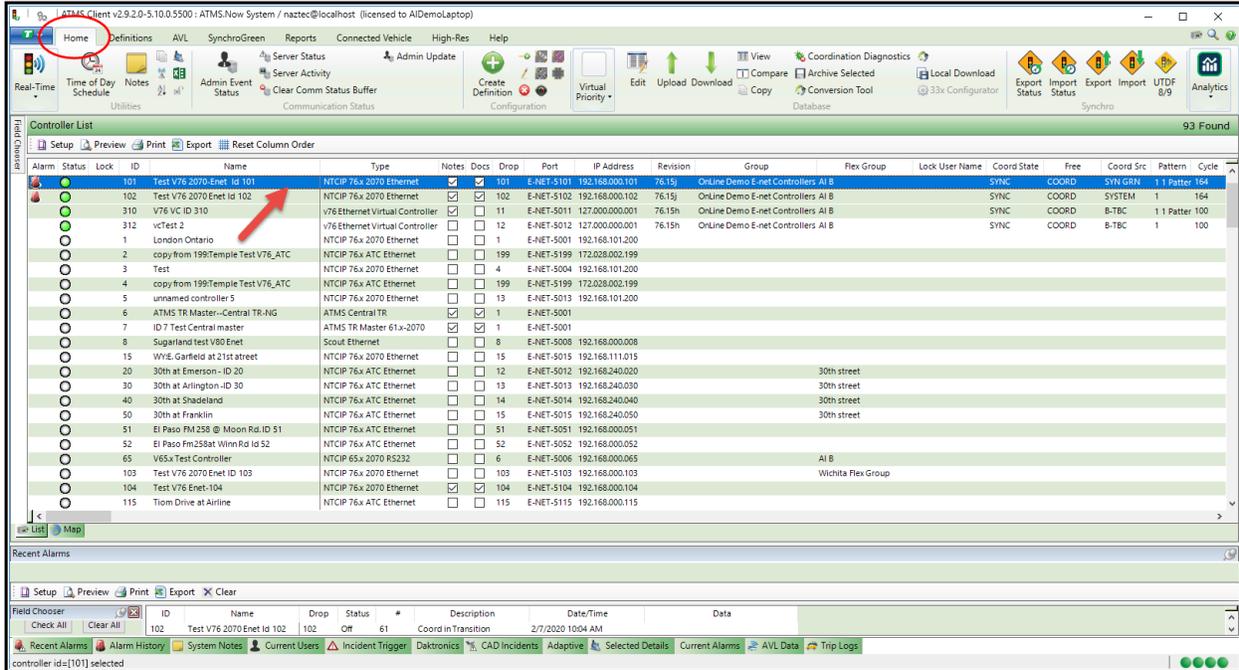
Field Chooser	ID	Name	Drop	Status	#	Description	Date/Time	Data
Check All Clear All	101	Test V76 2070-Enet Id 101	101	Off	61	Coord in Transition	2/7/2020 10:02 AM	

Recent Alarms Alarm History System Notes Current Users Incident Trigger Daktronics CAD Incidents Adaptive Current Alarms Trip Logs

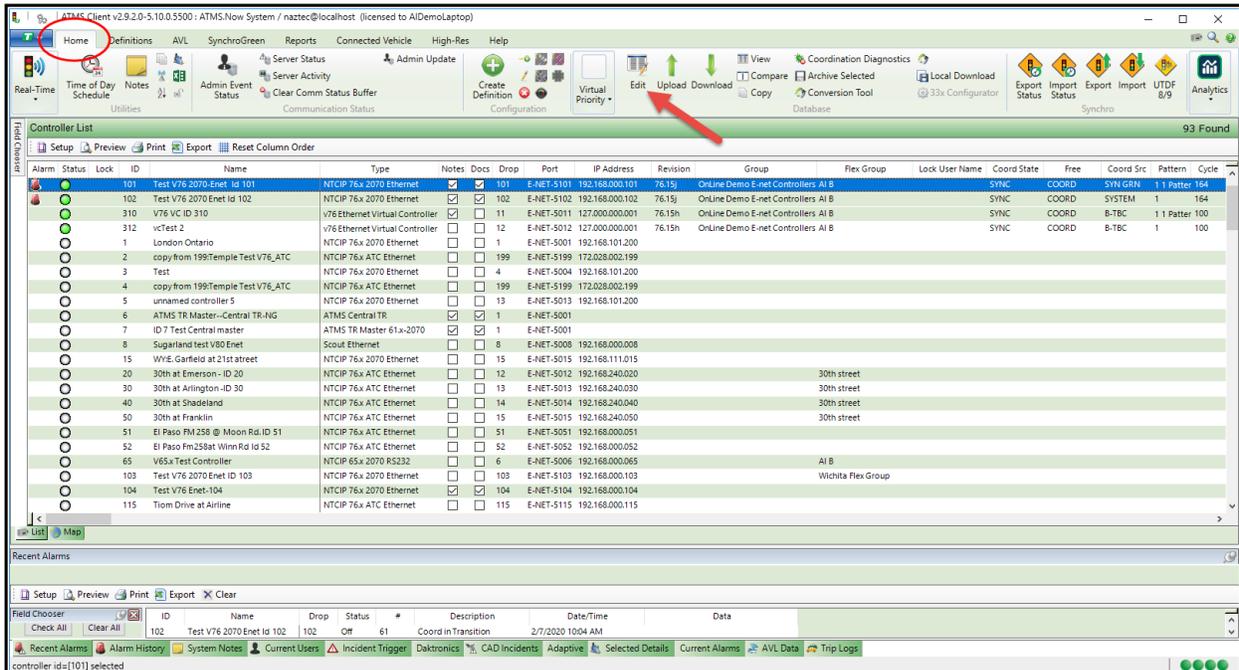
Controller Programming Emergency/Priority Data

Controller programming is done in ATMS via the **Home** Module.

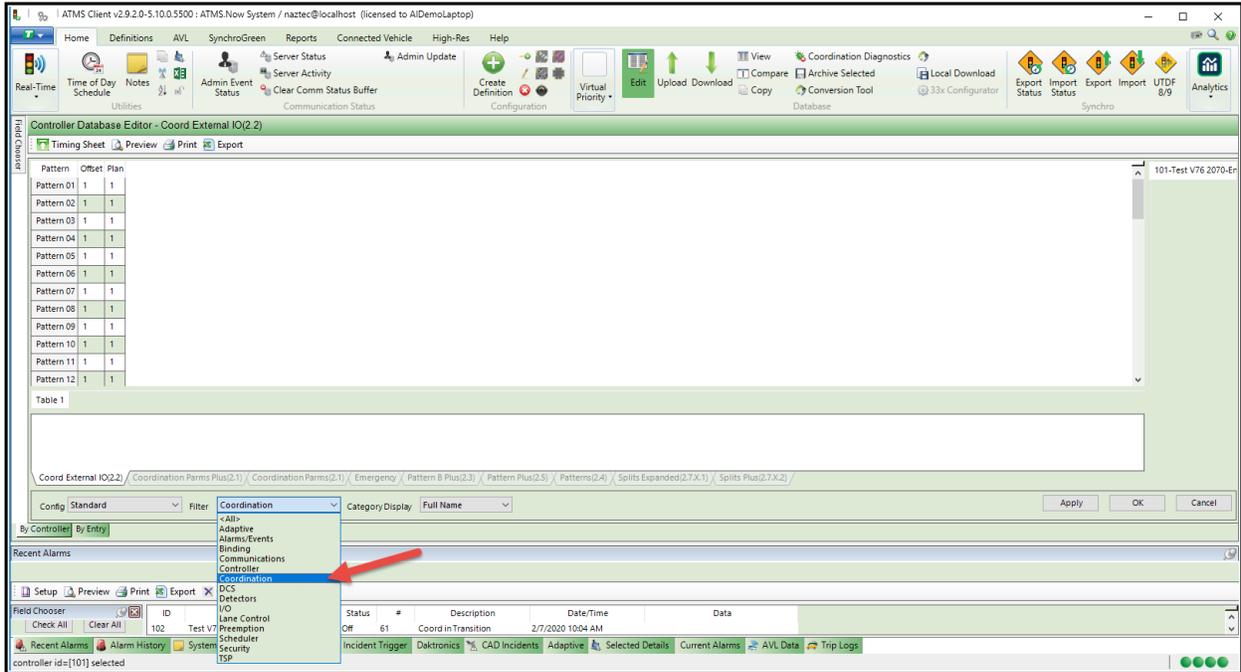
1) Select an intersection



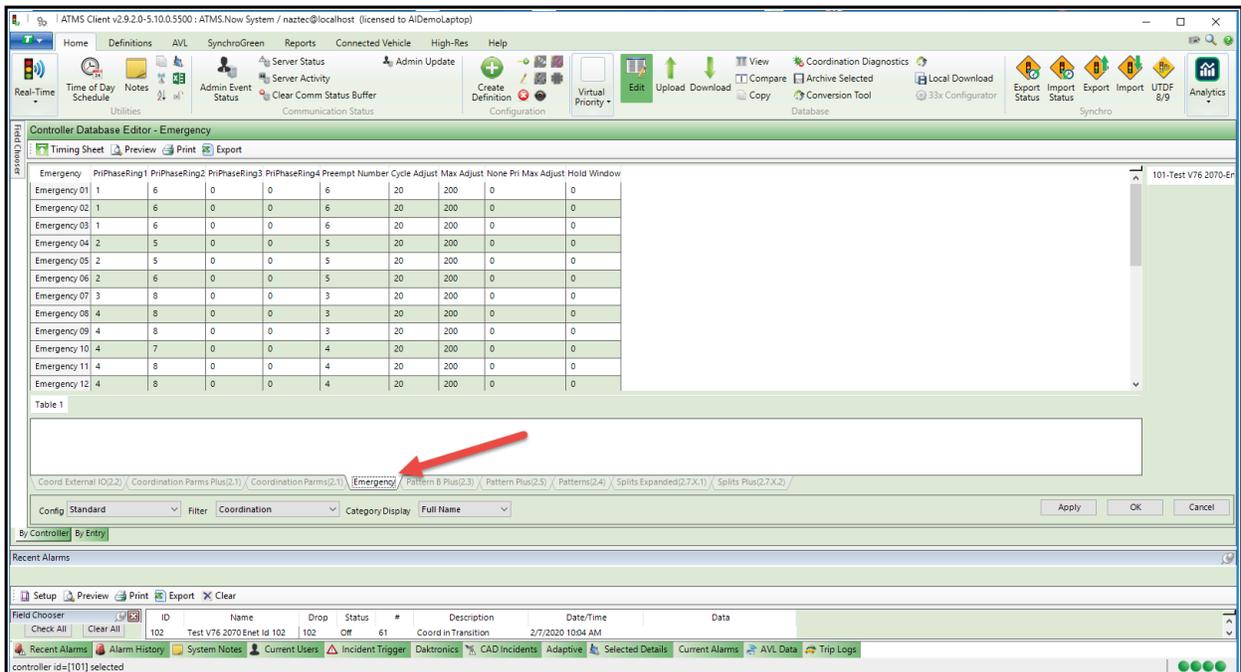
2) Under Actions do **Database->Edit**



3) Select the filter **Coordination**



4) Choose the Tab labeled **Emergency** which displays the programmable features.



Programming Intersection Data

The programming screen in ATMS is displayed below

Emergency	PriPhaseRing1	PriPhaseRing2	PriPhaseRing3	PriPhaseRing4	Preempt Number	Cycle Adjust	Max Adjust	None Pri Max Adjust	Hold Window
Emergency 01	0	0	0	0	0	0	0	0	0
Emergency 02	0	0	0	0	0	0	0	0	0
Emergency 03	0	0	0	0	0	0	0	0	0
Emergency 04	0	0	0	0	0	0	0	0	0
Emergency 05	0	0	0	0	0	0	0	0	0
Emergency 06	0	0	0	0	0	0	0	0	0
Emergency 07	0	0	0	0	0	0	0	0	0
Emergency 08	0	0	0	0	0	0	0	0	0
Emergency 09	0	0	0	0	0	0	0	0	0
Emergency 10	0	0	0	0	0	0	0	0	0
Emergency 11	0	0	0	0	0	0	0	0	0
Emergency 12	0	0	0	0	0	0	0	0	0

Table 1

Emergency Directions

The twelve rows, Emergency 1 through Emergency 12 are based on the direction table as shown below.

Emergency	Direction
1	NL (Northbound Left)
2	NT (Northbound Thru)
3	NR (Northbound Right)
4	SL (Southbound Left)
5	ST (Southbound Thru)
6	SR (Southbound Right)
7	EL (Eastbound Left)
8	ET (Eastbound Thru)
9	ER (Eastbound Right)
10	WL (Westbound Left)
11	WT (Westbound Thru)
12	WR (Westbound Right)

PriPhaseRing1, PriPhaseRing2, PriPhaseRing3, PriPhaseRing4

Program the appropriate Phase (per Ring) that is utilized by the Emergency Direction. Valid data is 0 through 16, where 0 indicates no phase is programmed.

For our example intersection, the following would be programmed.

Emergency #	Direction	Phase-R1	Phase-R2	Phase-R3	Phase-R4
1	NL	1	6		
2	NT	2	6		
3	NR	2	6		
4	SL	2	5		
5	ST	2	6		
6	SR	2	6		
7	EL	3	8		
8	ET	4	8		
9	ER	4	8		
10	WL	4	7		
11	WT	4	8		
12	WR	4	8		

ATMS programming is highlighted below.

Emergency	PriPhaseRing1	PriPhaseRing2	PriPhaseRing3	PriPhaseRing4
Emergency 01	1	6	0	0
Emergency 02	1	6	0	0
Emergency 03	1	6	0	0
Emergency 04	2	5	0	0
Emergency 05	2	5	0	0
Emergency 06	2	6	0	0
Emergency 07	3	8	0	0
Emergency 08	4	8	0	0
Emergency 09	4	8	0	0
Emergency 10	4	7	0	0
Emergency 11	4	8	0	0
Emergency 12	4	8	0	0

When programming this data the user should consider programming allowable non-conflicting movements so traffic flow is not disrupted. Consider these examples. Emergency 1 (NL) is associated with Phase 1. However, while Phase 1 is running, the associated straight through movement, Phase 6 can also be run. Emergency 2 (NT) is associated with Phase 6. However, while Phase 6 is running, the Straight through movement on the other side of the road, Phase 2, can also be run. This analysis must be done for all directions.

Preempt Number

When Emergency/Priority has been actuated for an intersection, ATMS considers the arrival time of the vehicle to that intersection. If the vehicle is set to arrive in less than 30 seconds, preemption will be run to insure that the vehicle gets a green. The user should review that the emergency vehicle preemptions (Preempts 3-6) are programmed and will associate the preemptions to each direction.

For our example, the following preemptions were programmed in the controller:

Preempt Direction Phase

3	E	3,8
4	W	4,7
5	S	2,5
6	N	1,6

This results in the following programming:

Emergency	PriPhaseRing1	PriPhaseRing2	PriPhaseRing3	PriPhaseRing4	Preempt Number
Emergency 01	1	6	0	0	6
Emergency 02	1	6	0	0	6
Emergency 03	1	6	0	0	6
Emergency 04	2	5	0	0	5
Emergency 05	2	5	0	0	5
Emergency 06	2	6	0	0	5
Emergency 07	3	8	0	0	3
Emergency 08	4	8	0	0	3
Emergency 09	4	8	0	0	3
Emergency 10	4	7	0	0	4
Emergency 11	4	8	0	0	4
Emergency 12	4	8	0	0	4

Cycle Adjust (0 -255)

The Cycle Adjust is a "Stretch" setting, and is the percentage that the cycle length will be allowed to grow. The user selects the amount of time the cycle length can be adjusted.

For the purposes of testing, it was found a cycle adjust value of 20 % had a positive benefit to the emergency vehicle without having an observable negative impact to general traffic flow.

This value can be left "0" if no cycle length change is desired.

For our example we will program cycle adjust to be 20 seconds.

Emergency	PriPhaseRing1	PriPhaseRing2	PriPhaseRing3	PriPhaseRing4	Preempt Number	Cycle Adjust
Emergency 01	1	6	0	0	6	20
Emergency 02	1	6	0	0	6	20
Emergency 03	1	6	0	0	6	20
Emergency 04	2	5	0	0	5	20
Emergency 05	2	5	0	0	5	20
Emergency 06	2	6	0	0	5	20
Emergency 07	3	8	0	0	3	20
Emergency 08	4	8	0	0	3	20
Emergency 09	4	8	0	0	3	20
Emergency 10	4	7	0	0	4	20
Emergency 11	4	8	0	0	4	20
Emergency 12	4	8	0	0	4	20

Max Adjust (0-255) and Non-Priority Max Adjust (0-255)

The Max adjustment is for operating the system when the controller is **not** in coordinated mode. The Non-Priority Max Adjust is used for both Coordinated and Free modes. These times are used when the ETA timer is less than two cycle lengths and Priority is in state 7 (Stretch Soft Flush Run) or 9 (Soft Flush Run).

The user is allowed to adjust the max times of the emergency phases (using the Max Adjust parameter) and the non-emergency phases (using the Non-Priority Max Adjust parameter) independently. **The user must program the MAX2 times for this feature to be enabled.** The time entered is the percentage of the current MAX2 time that the new max time will be. For example, side streets could have their max time reduced by entering a value less than 100%, while emergency phases could be increased by entering a value greater than 100%. Programming 100% for these values will use the Max2 times. Programming 0 in these fields will not adjust the Max times.

In our example, when we are in Free operation we will allow all Emergency/Priority directions to double their MAX2 times to accommodate the emergency vehicle. Therefore we will program 200 in the Max Adjust field. We will also program all non-priority phases not to adjust their max times. Therefore we will program 0 in the Non-Priority Max Adjust field.

Emergency	PriPhaseRing1	PriPhaseRing2	PriPhaseRing3	PriPhaseRing4	Preempt Number	Cycle Adjust	Max Adjust	None Pri Max Adjust	I
Emergency 01	1	6	0	0	6	20	200	0	
Emergency 02	1	6	0	0	6	20	200	0	
Emergency 03	1	6	0	0	6	20	200	0	
Emergency 04	2	5	0	0	5	20	200	0	
Emergency 05	2	5	0	0	5	20	200	0	
Emergency 06	2	6	0	0	5	20	200	0	
Emergency 07	3	8	0	0	3	20	200	0	
Emergency 08	4	8	0	0	3	20	200	0	
Emergency 09	4	8	0	0	3	20	200	0	
Emergency 10	4	7	0	0	4	20	200	0	
Emergency 11	4	8	0	0	4	20	200	0	
Emergency 12	4	8	0	0	4	20	200	0	

Hold Window (0-255)

This variable will hold priority green phase(s) for the time in seconds that you program if the ETA is less than this value. This holds that phase for the remainder of the ETA time. The user should consider the time it will take to get back to the priority phase(s) in the next cycle, when calculating this value. In our example we will program 0.

Emergency	PriPhaseRing1	PriPhaseRing2	PriPhaseRing3	PriPhaseRing4	Preempt Number	Cycle Adjust	Max Adjust	None Pri Max Adjust	Hold Window
Emergency 01	1	6	0	0	6	20	200	0	0
Emergency 02	1	6	0	0	6	20	200	0	0
Emergency 03	1	6	0	0	6	20	200	0	0
Emergency 04	2	5	0	0	5	20	200	0	0
Emergency 05	2	5	0	0	5	20	200	0	0
Emergency 06	2	6	0	0	5	20	200	0	0
Emergency 07	3	8	0	0	3	20	200	0	0
Emergency 08	4	8	0	0	3	20	200	0	0
Emergency 09	4	8	0	0	3	20	200	0	0
Emergency 10	4	7	0	0	4	20	200	0	0
Emergency 11	4	8	0	0	4	20	200	0	0
Emergency 12	4	8	0	0	4	20	200	0	0

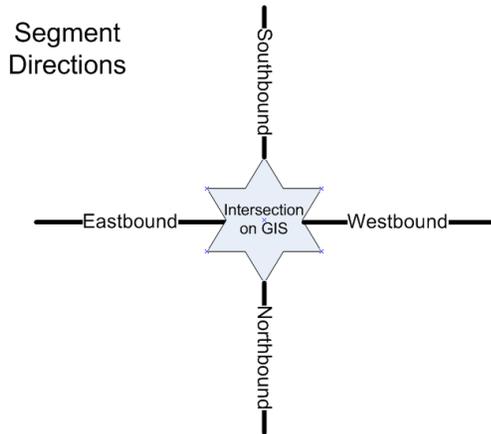
ATMS GIS Segment setup

GIS references all maps using X-Y Coordinates. The Emergency Responder Algorithm relies on setting up segments on the ATMS GIS map. The segments are used by the Agency's CAD system to produce Routes that the Emergency vehicle will travel through.

Segment Editor

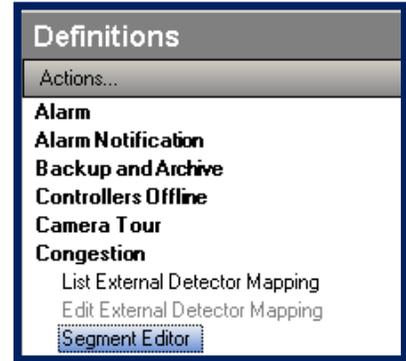
The *Segment Editor* provides the ability to assign approach segments for Congestion reporting. The *Segment Editor* tool performs this by drawing parallel lines to the GIS centerlines displayed in the Editor.

To create Congestion segments in ATMS, select **Definitions->Segment Editor->Controllers**. The *Overview* pane will display a two-part window with each controller in the upper half



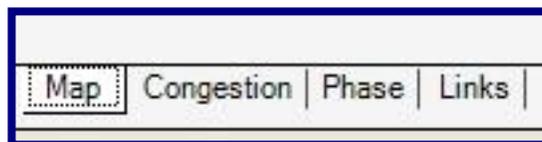
and the GIS centerline map in the lower half. If multiple GIS line files are used in your ATMS mapping system, such as a fiber backbone layer, make sure that you select the centerline file for congestion drawing. The default color for the centerline layer is a blue line format.

Each controller on the list displays eight boxes, one for each direction of the eight-point compass. If a box is checked, then a segment has already been assigned for that direction of the intersection.



NOTE: The same compass assignments must be assigned to the Segment as defined in the *Congestion, Turning Phase Movements, and Link Speed* programming screen for the controller. Without this proper consistency, the detector counts will not be properly routed to the Segments.

When a targeted controller is selected, ATMS will zoom the *Segment Editor* GIS map to the intersection, and four tabs will appear on the bottom of the *Overview* Pane: Map, Congestion, Phase and Links, as shown below. Each tab enables the user to define the related or edit the parameters for the selected controller. Selecting these tabs shortcut to the same programming screens as the *Congestion, Turning Phase Movements, and Link Speed Definitions* as found in the *Home* module under *Actions...Configuration*.



Map Tab

Selecting the Map option takes the user to the Controller Segment Editor. The Overview Pane will be divided into two halves. The upper half will contain the list of defined intersections. The lower half will provide the system map display. By selecting an intersection from the list in the upper half, the user will display that intersection's location on the system map in the lower half of the Overview Pane, as shown in the figure below.

Map Navigation Toolbar

The *Controller Segment Editor* control is performed by selecting a toolbar function from the upper left of the GIS map:



To navigate the *GIS Location Editor* map, select one of the following icons:



Information – Selecting this function will provide real-time information of the device using a “Hover Balloon”, by placing the mouse over the desired map object.



Zoom-In – Selecting this function will allow the user to click on a point on the map and wrap around a desired area to zoom.



Zoom-Out – After selecting this, clicking once on the map will zoom out 1 measure of extent.



Pan – This enables the user to “grab” the map and slide it in any direction.



Full Extent – By clicking this icon, the GIS map will zoom out to the fullest extent.



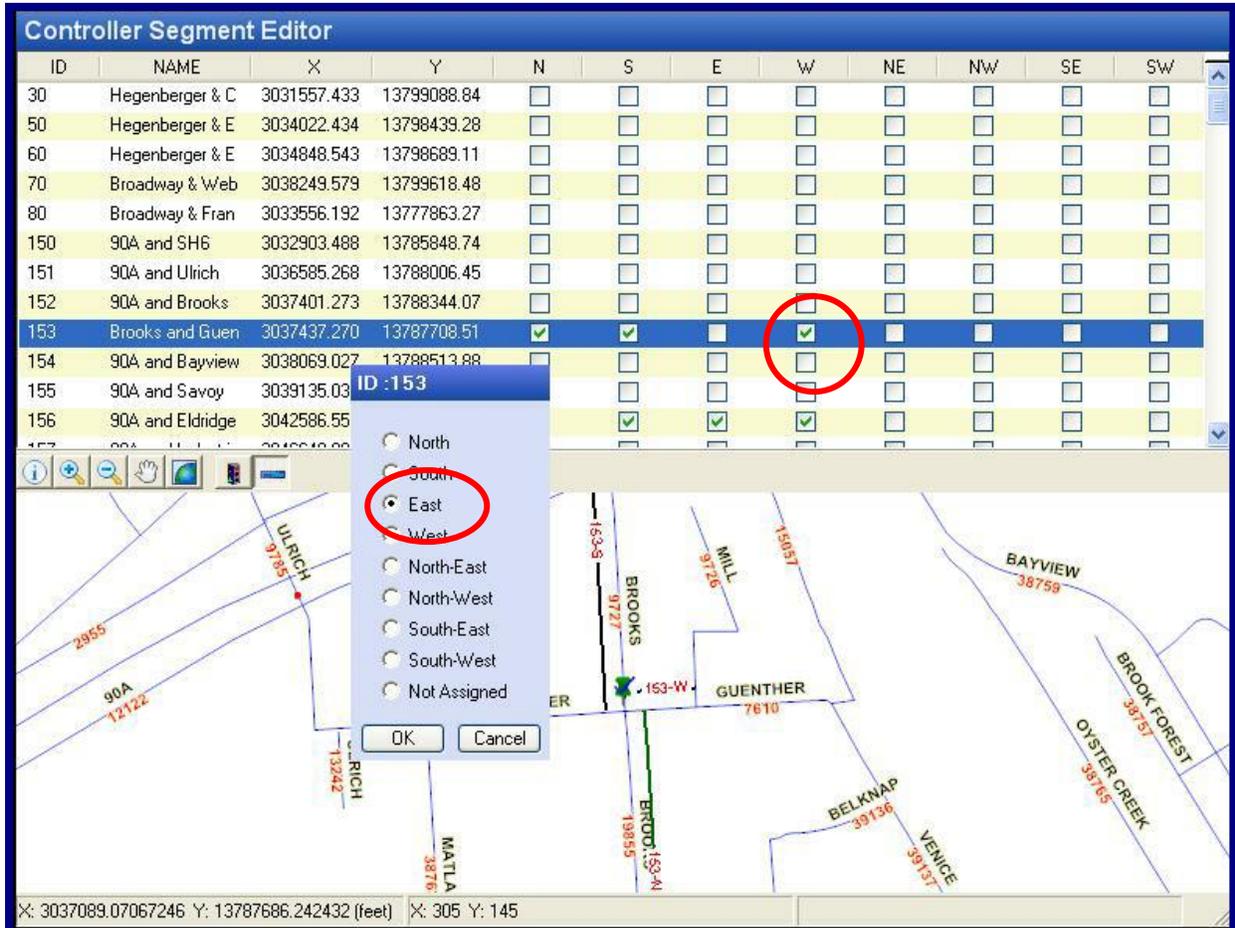
Edit Controller – After clicking this icon, the user can “rubber-band” around another intersection on the map for Segment Editing instead of navigating to the next intersection from the list. After selecting an intersection with this process the “push-pin” will appear at the newly-selected intersection, and the list will automatically navigate to and highlight the selected intersection from the map.



Add Shape – Provides congestion line drawing to be assigned for each approach.

To create a line segment, select the "Add Shape" icon .

Next, place your mouse on the approach line segment for the intersection and "left-click". A box will appear to select the corresponding compass direction for the approach segment. A choice of eight compass directions will be available. Select the direction and click "OK". A colored line segment will be drawn parallel to the centerline segment and the corresponding compass box will be checked in the list. The length of this line segment is determined by the termination points of the GIS file. An approach can have any number of congestion segments drawn for each approach. This allows each approach to be drawn completely between controllers even though there are segment breaks in the lines.



The screenshot displays the "Controller Segment Editor" interface. At the top is a table with columns for ID, NAME, X, Y, and eight compass directions (N, S, E, W, NE, NW, SE, SW). The row for ID 153, "Brooks and Guen", is highlighted in blue. A red circle highlights the 'W' checkbox in this row. Below the table is a map showing a network of roads including Ulrich, Brooks, Guenther, Mill, Bayview, Brook Forest, Oyster Creek, Belknap, Venice, Matla, and 90A. A dialog box titled "ID : 153" is open over the map, listing compass directions with radio buttons. The "East" option is selected and circled in red. The dialog also includes "OK" and "Cancel" buttons. At the bottom of the window, coordinates are shown: X: 3037089.07067246 Y: 13787686.242432 (feet) X: 305 Y: 145.

ID	NAME	X	Y	N	S	E	W	NE	NW	SE	SW
30	Hegenberger & C	3031557.433	13799088.84	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50	Hegenberger & E	3034022.434	13798439.28	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
60	Hegenberger & E	3034848.543	13798689.11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
70	Broadway & Web	3038249.579	13799618.48	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
80	Broadway & Fran	3033556.192	13777863.27	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
150	90A and SH6	3032903.488	13785848.74	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
151	90A and Ulrich	3036585.268	13788006.45	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
152	90A and Brooks	3037401.273	13788344.07	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
153	Brooks and Guen	3037437.270	13787708.51	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
154	90A and Bayview	3038069.027	13788513.88	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
155	90A and Savoy	3039135.03		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
156	90A and Eldridge	3042586.55		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Controller Segment Editor

ID	NAME	X	Y	N	S	E	W	NE	NW	SE	SW
30	Hegenberger & C	3031557.433	13799088.84	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50	Hegenberger & E	3034022.434	13798439.28	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
60	Hegenberger & E	3034848.543	13798689.11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
70	Broadway & Web	3038249.579	13799618.48	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
80	Broadway & Fran	3033556.192	13777863.27	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
150	90A and SH6	3032903.488	13785848.74	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
151	90A and Ulrich	3036585.268	13788006.45	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
152	90A and Brooks	3037401.273	13788344.07	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
153	Brooks and Guen	3037437.270	13787708.51	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
154	90A and Bayview	3038069.027	13788513.88	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
155	90A and Savoy	3039135.034	13788786.68	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
156	90A and Eldridge	3042586.555	13789681.45	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

X: 3037190.98836613 Y: 13787527.418234 (feet) X: 309 Y: 159

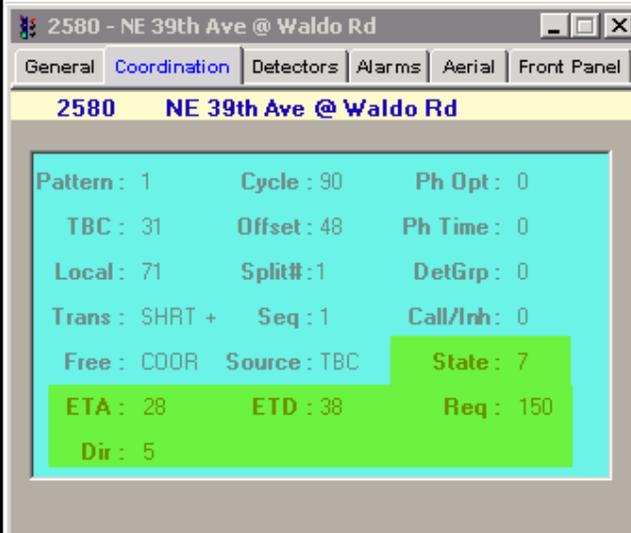
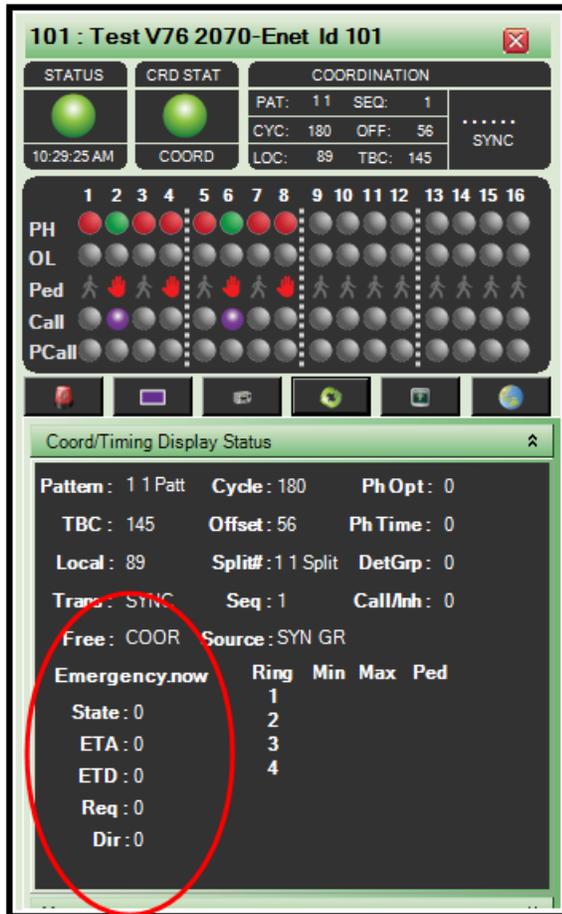
Map | Congestion | Phase | Links

Proper segment assignments will result in matching the CAD Route with ATMS.

ATMS Status Displays

The Emergency/Priority module in ATMS provides Real time status to monitor the Emergency/Priority states as the emergency vehicle passes through the system.

Priority Status is shown for each controller utilizing the existing Real-Time status screen. Go to **Home->Real-time->Scan**. In the classic view choose the tab labeled **Coordination**. Under coordination there are five fields that are reported from the Emergency/Priority module as shown below:



State

The following is a list of possible states that may occur once the Emergency/Priority begins:

State	Priority call
0	Reset
1	Idle
2	Preempt Init
3	Preempt Run
4	Max Mode Init
5	Max Mode Run
6	Stretch Soft Flush Init
7	Stretch Soft Flush Run
8	Soft Flush Init
9	Soft Flush Run
10	Transit Init
11	Transit Run
12	Recovery Init
13	Recovery Run

ETA

This is the estimated time of arrival of the emergency vehicle to the intersection

ETD

This is the estimated time of departure of the emergency vehicle from the intersection

REQ

This is the emergency vehicle's id number that has requested emergency service.

DIR

This is the direction number of the emergency vehicle. Valid directions and associated direction numbers are shown in the table below.

Direction #	Direction
0	Emergency/priority module not active
1	NL (Northbound Left)
2	NT (Northbound Thru)
3	NR (Northbound Right)
4	SL (Southbound Left)
5	ST (Southbound Thru)
6	SR (Southbound Right)
7	EL (Eastbound Left)
8	ET (Eastbound Thru)
9	ER (Eastbound Right)
10	WL (Westbound Left)
11	WT (Westbound Thru)
12	WR (Westbound Right)

Emergency Responder Operation

Once the user programs the intersections and plots the GIS segments that are used by the Emergency Responder module, the following operational timeline occurs. The user should be aware that the agency's CAD system is in constant communications with the Emergency vehicle and that the CAD system is sending an XML stream to ATMS on a real-time basis.

- 1) The CAD system will send the route information to ATMS. This route information includes the Emergency vehicle Unit ID, the routed GIS segments from beginning to end. It is timed stamped.
- 2) Once the vehicle starts to move through the first GIS segment, a speed is calculated as well as an estimated time of arrival (ETA) and an estimated time of departure (ETD) for each intersection that is on the route. Both ETA and ETD is calculated in seconds.
- 3) The Vehicle speed and distance from the intersection, ETA and ETD are constantly being recalculated/updated as the vehicle travels through each routed segment. Each update is timestamped. When travelling through the first segment, an initial speed of 45 mph will be used, until the next vehicle update occurs.
- 4) There are two modes of operation in the controller, Free or Coordinated that are affected by the Emergency responder Algorithm.
- 5) Free Mode
 - a. All intersections will be preempted along the Route once the ETA is 30 seconds or less.
- 6) Coordinated Mode
 - a. During the initial segment of the route, if the ETA is 30 seconds or less, the intersection will be preempted. If the ETA for this segment is greater than 30 seconds and for all subsequent segments the algorithm will modify phase times. The phase time modifications will be calculated to either Flush the intersection in the direction of the vehicle or try to be in green when the ETA =0 seconds.

Below is an excerpt of log data showing this information:

```
Sending Priority Request at - 2/26/2020 2:23:13 PM  
Req ID = 60121, Vehicle ID = DC42  
id=1605, req=0, cmd=CMD_ROUTE, dir=NR, dist=1600, spd=45, eta=139, etd=154  
id=1610, req=0, cmd=CMD_ROUTE, dir=ET, dist=2958, spd=45, eta=160, etd=175  
id=1615, req=0, cmd=CMD_ROUTE, dir=ET, dist=5354, spd=45, eta=196, etd=211
```

id is the intersection number

req is the priority request number,

cmd is the priority command

dir is the direction of vehicle travel through the segment

dist is the distance that the vehicle is from the center of the intersection

spd is the speed of the vehicle

eta is the Estimated time of arrival

etd is the Estimated time of Departure

- 7) Intersections that are further away in the route will generate a pending update message. They will be updated as the vehicle moves through the route and gets close enough for the calculations to occur.
- 8) Once a vehicle moves past an intersection, the intersection is eligible to be updated by another vehicle via its dispatched route.
- 9) When the vehicle Completes the Dispatched route the Emergency responder algorithm will send a "terminate Route" Command.

ATMS Emergency Responder Details and Reporting

The GIS Map will display AVL Vehicles Live as they move through the system as shown below.



The agency can set up Priority Alarm 77 to change the Status Icon for intersections currently running the Emergency Responder algorithm.

The list view below shows Alarm 77 as a Dark Blue icon. The agency can tie Alarm 77 to an Icon color using the **Definitions-> Active Alarm Description** setting. The intersections below are currently under the Emergency Responder Algorithm's control.

ID	Status	Name	Notes	Doc#	X-Reference	Coord	State	Pattern	Cycle	Time Diff (Sec)	Seq	P1	P2	P3	P4	P5	P6	P7	P8	Air Time	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8	Total	Controller Time	Offline	Schedule#	Action#
2540	●	Riddle Rd and Congress Av	<input checked="" type="checkbox"/>		32950	SYNC	3	140			1	●	●	●	●	●	●	●	●	0	●	●	●	●	●	●	●	●	4548	2/27/2020 3:50 PM	<input type="checkbox"/>	1	3
490	●	PGA Bl and Ellison Wilson Rd	<input checked="" type="checkbox"/>		14475	LOGN-25	1	160	0		1	●	●	●	●	●	●	●	●	1	●	●	●	●	●	●	●	●	5406	2/27/2020 3:50 PM	<input type="checkbox"/>	1	1
2905	●	Cresthaven Bl and Military Trail	<input checked="" type="checkbox"/>		35025	SYNC	3	160	0		2	●	●	●	●	●	●	●	●	3	●	●	●	●	●	●	●	●	4464	2/27/2020 3:50 PM	<input type="checkbox"/>	1	3
4040	●	Boynton Besh Bl and Military Trail	<input checked="" type="checkbox"/>		46100	SYNC	3	160	0		5	●	●	●	●	●	●	●	●	1	●	●	●	●	●	●	●	3946	2/27/2020 3:50 PM	<input type="checkbox"/>	1	3	
5370	●	Glades Rd and Ft. Turpinke	<input checked="" type="checkbox"/>		62510	SYNC	3	170	0		2	●	●	●	●	●	●	●	●	3	●	●	●	●	●	●	●	4849	2/27/2020 3:50 PM	<input type="checkbox"/>	1	3	
7	●	Singal Shop Test Area	<input checked="" type="checkbox"/>		2333900	FREE	3	254	0		1	●	●	●	●	●	●	●	●	0	●	●	●	●	●	●	●	4545	2/27/2020 3:50 PM	<input type="checkbox"/>	1	100	
825	●	Blue Heron Bl and I-95	<input checked="" type="checkbox"/>		20150	SYNC	3	160	0		1	●	●	●	●	●	●	●	●	0	●	●	●	●	●	●	●	3410	2/27/2020 3:50 PM	<input type="checkbox"/>	1	3	
2352	●	Forest Hill and Queucus	<input checked="" type="checkbox"/>		31500	FREE	3	160	0		1	●	●	●	●	●	●	●	●	3	●	●	●	●	●	●	●	4270	2/27/2020 3:50 PM	<input type="checkbox"/>	1	3	
1915	●	Westgate Av and Military Trail	<input checked="" type="checkbox"/>		25200	SYNC	3	200	0		1	●	●	●	●	●	●	●	●	3	●	●	●	●	●	●	●	3985	2/27/2020 3:48 PM	<input type="checkbox"/>	1	3	
1580	●	Cherry Rd and Military Trail	<input checked="" type="checkbox"/>		28800	SYNC	3	180	0		3	●	●	●	●	●	●	●	●	3	●	●	●	●	●	●	●	3663	2/27/2020 3:48 PM	<input type="checkbox"/>	1	3	
1990	●	Belvedere Rd and Military Trail	<input checked="" type="checkbox"/>		29225	SYNC	3	180	0		9	●	●	●	●	●	●	●	●	3	●	●	●	●	●	●	●	4564	2/27/2020 3:48 PM	<input type="checkbox"/>	1	3	
3350	●	Melaleuca Ln and Military Trail	<input checked="" type="checkbox"/>		39100	SYNC	3	160	0		1	●	●	●	●	●	●	●	●	3	●	●	●	●	●	●	●	4814	2/27/2020 3:49 PM	<input type="checkbox"/>	1	3	
4240	●	Golf Rd and Military Trail	<input checked="" type="checkbox"/>		48190	FREE	3	254	0		1	●	●	●	●	●	●	●	●	0	●	●	●	●	●	●	●	4189	2/27/2020 3:50 PM	<input type="checkbox"/>	1	100	
4675	●	Atlantic Av and El Clair Ranch Rd	<input checked="" type="checkbox"/>		53054	SYNC	3	170	0		1	●	●	●	●	●	●	●	●	3	●	●	●	●	●	●	●	3673	2/27/2020 3:50 PM	<input type="checkbox"/>	1	3	
4680	●	Atlantic Av and Lakes of Delray	<input checked="" type="checkbox"/>		53055	SYNC	3	170	0		1	●	●	●	●	●	●	●	●	3	●	●	●	●	●	●	●	4880	2/27/2020 3:50 PM	<input type="checkbox"/>	1	3	
4685	●	Atlantic Av and Via Flora	<input checked="" type="checkbox"/>		53060	SYNC	3	170	0		1	●	●	●	●	●	●	●	●	3	●	●	●	●	●	●	●	4515	2/27/2020 3:50 PM	<input type="checkbox"/>	1	3	
5	●	Roberts Office	<input checked="" type="checkbox"/>		0							●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	90		<input type="checkbox"/>			

The Details pane displays detailed Priority information using the AVL Tab

The screenshot shows the AVL Data interface. At the top, there is a search filter table with columns for Unit ID, Name, Class, Last Date, Last Time, Direction, Speed, and Cross 1. Below this is a table of AVL Data with columns: Unit ID, Vehicle_id, Name, Class, Last Date, Last Time, Direction, Speed, and Cross 1. The table contains several rows of data, including Unit IDs like 15745589, 18551974, 18551954, 23738920, 23776272, 23776291, 24874105, and 24000491. A search filter panel on the left includes dropdowns for Unit ID and Class, and buttons for 'Reset All...' and 'Find Now...'. At the bottom, there are date range selectors for 'Begin Date' and 'End Date', and a 'Show Row' button.

The Reports Module is used to select AVL Reports.

The screenshot shows the Reports Module interface. The top navigation bar includes 'Home', 'Definitions', 'AVL', 'Reports', and 'Help'. Below the navigation bar is a toolbar with icons for 'All Reports', 'Alpha', 'AVL', 'CMS', 'Controller Database', 'GIS', 'SynchroGreen', 'Trip Logger', 'Users', 'Volume', 'Purdue', 'Device', and 'Parking'. The main area is titled 'Available Reports' and contains a table with columns for 'Report Category', 'Report Name', and 'Description'. The table lists various reports such as 'AVL Location', 'AVL Speed', 'Detected Speed', 'Vehicle Classification', 'Vehicle Travel Time Report', 'Vehicle Trigger Status Report', 'Virtual Priority Report', 'Compare Controllers Database Configurations', 'Conflict/MMU Report', 'Controller Communication Errors', 'Controller Pattern', 'Controller Pattern Graph', 'CSV Export', 'Database Comparison', 'Detector Failure Report', 'Detector Failure Threshold Report', 'Field Alarms', 'Flex Group Participation', and 'Incident Trigger Report'. A configuration window titled 'Virtual Priority Report' is open on the right side, showing fields for 'Controller ID', 'Controller Name', 'Flex Group', 'Begin Date Time', and 'End Date Time', along with 'Reset All...' and 'Run Report' buttons.

ATMS Priority Status Report

Priority Report

8/2/2012



ID	Name	Date Time	Sequence No.	Request ID	Vehicle	Direction	Priority
125	Indiantown Rd and Central Bl	3/16/2012 5:25:18PM	1331876310516	44,532	R19	SE	CMD_ROUTE
125	Indiantown Rd and Central Bl	3/16/2012 5:26:01PM	0	44,532	R19	SE	CMD_TERMINATE
135	Indiantown Rd and Chasewood Plaza	3/16/2012 5:25:18PM	1331876310516	44,532	R19	EE	CMD_ROUTE
135	Indiantown Rd and Chasewood Plaza	3/16/2012 5:26:01PM	0	44,532	R19	EE	CMD_TERMINATE
140	Indiantown Rd and Center St	3/16/2012 5:25:18PM	1331876310516	44,532	R19	EE	CMD_ROUTE
140	Indiantown Rd and Center St	3/16/2012 5:26:01PM	0	44,532	R19	EE	CMD_TERMINATE
145	Indiantown Rd and Maplewood Dr	3/16/2012 5:25:18PM	1331876310516	44,532	R19	EE	CMD_ROUTE
145	Indiantown Rd and Maplewood Dr	3/16/2012 5:26:01PM	0	44,532	R19	EE	CMD_TERMINATE
170	Indiantown Rd and Alt A1A	3/16/2012 5:25:18PM	1331876310516	44,532	R19	ES	CMD_ROUTE
170	Indiantown Rd and Alt A1A	3/16/2012 5:26:01PM	0	44,532	R19	ES	CMD_TERMINATE
150	Indiantown Rd and Delaware Bl	3/16/2012 5:25:18PM	1331876310516	44,532	R19	EE	CMD_ROUTE
150	Indiantown Rd and Delaware Bl	3/16/2012 5:26:01PM	0	44,532	R19	EE	CMD_TERMINATE
155	Indiantown Rd and Pennock Ln	3/16/2012 5:25:18PM	1331876310516	44,532	R19	EE	CMD_ROUTE
155	Indiantown Rd and Pennock Ln	3/16/2012 5:26:01PM	0	44,532	R19	EE	CMD_TERMINATE
160	Indiantown Rd and Military Trail	3/16/2012 5:25:18PM	1331876310516	44,532	R19	EE	CMD_ROUTE
160	Indiantown Rd and Military Trail	3/16/2012 5:26:01PM	0	44,532	R19	EE	CMD_TERMINATE
165	Indiantown Rd and Loxahatchee Rd	3/16/2012 5:25:18PM	1331876310516	44,532	R19	EE	CMD_ROUTE
165	Indiantown Rd and Loxahatchee Rd	3/16/2012 5:26:01PM	0	44,532	R19	EE	CMD_TERMINATE
205	Toney Penna Dr and Alt A1A	3/16/2012 5:25:18PM	1331876310516	44,532	R19	SW	CMD_ROUTE
205	Toney Penna Dr and Alt A1A	3/16/2012 5:26:01PM	0	44,532	R19	SW	CMD_TERMINATE