

GPS Solutions for Transit

Miami Trolley in Real Time

web-based and mobile device applications



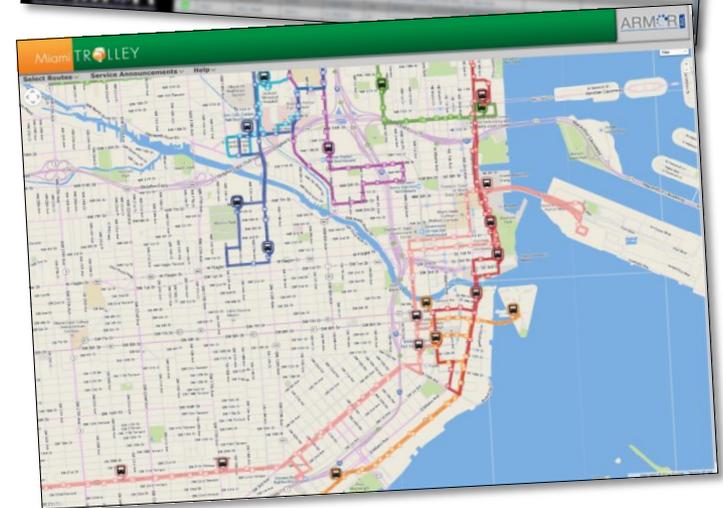
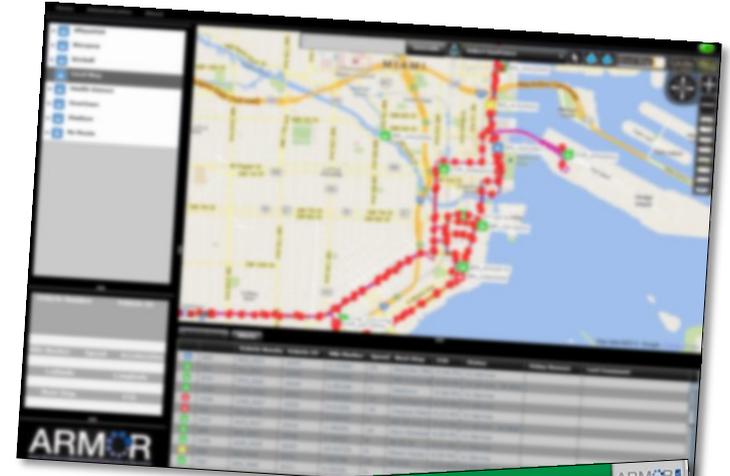
July 2014



The Transportation Trust Municipal Workshop

Presentation Outline

- Program Overview
- Route Information
- ITS Applied to Transit
- What's Next



July 2014



The Transportation Trust Municipal Workshop

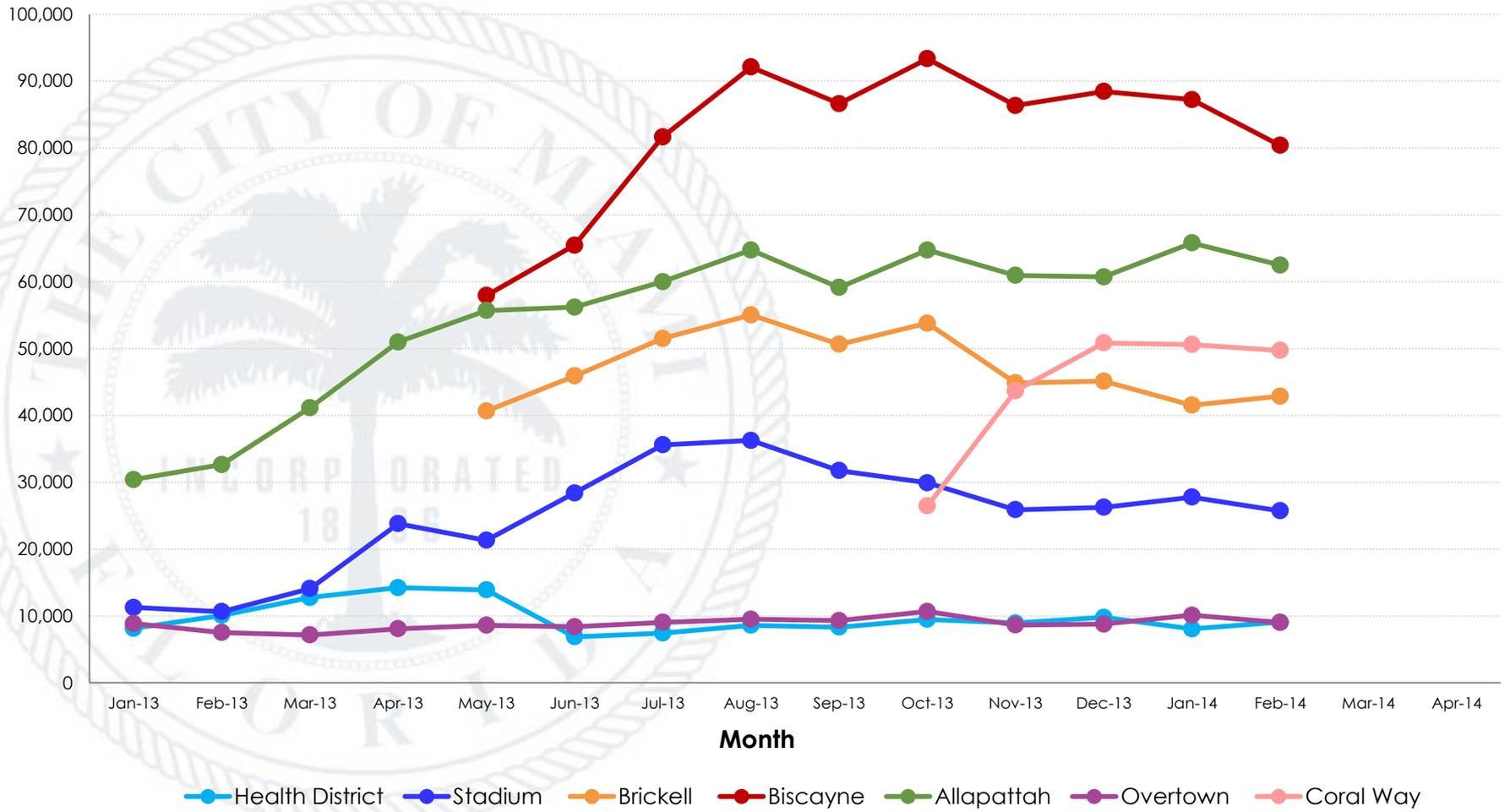
Overview

Program Development

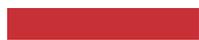


- Routes saw rapid ridership growth during initial months
- Ridership still growing, but at a slower pace
- More than **4 million passengers** have used the system since program launch in February 2012
- 2.6 million riders in 2013
- More than 3 million anticipated in 2014

Ridership 2013-2014



July 2014

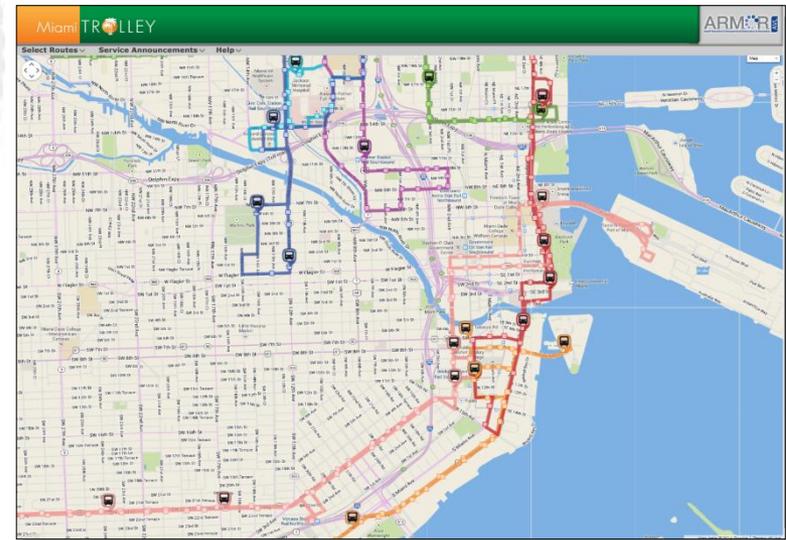
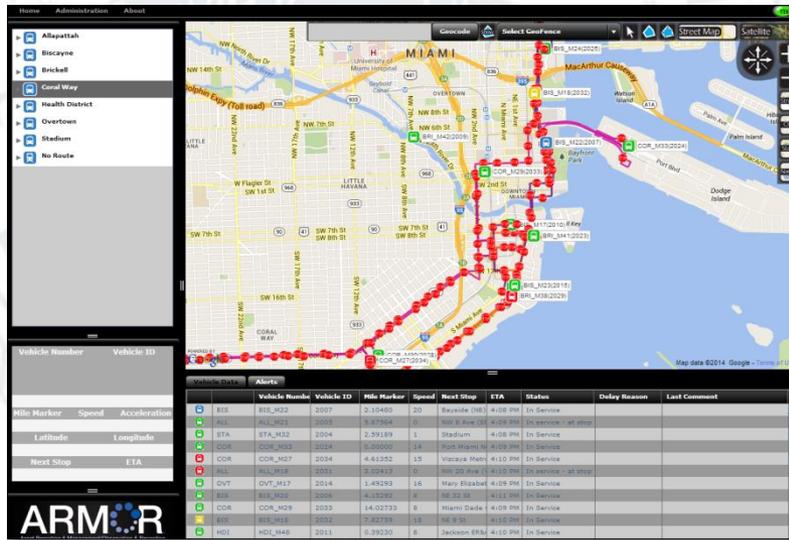


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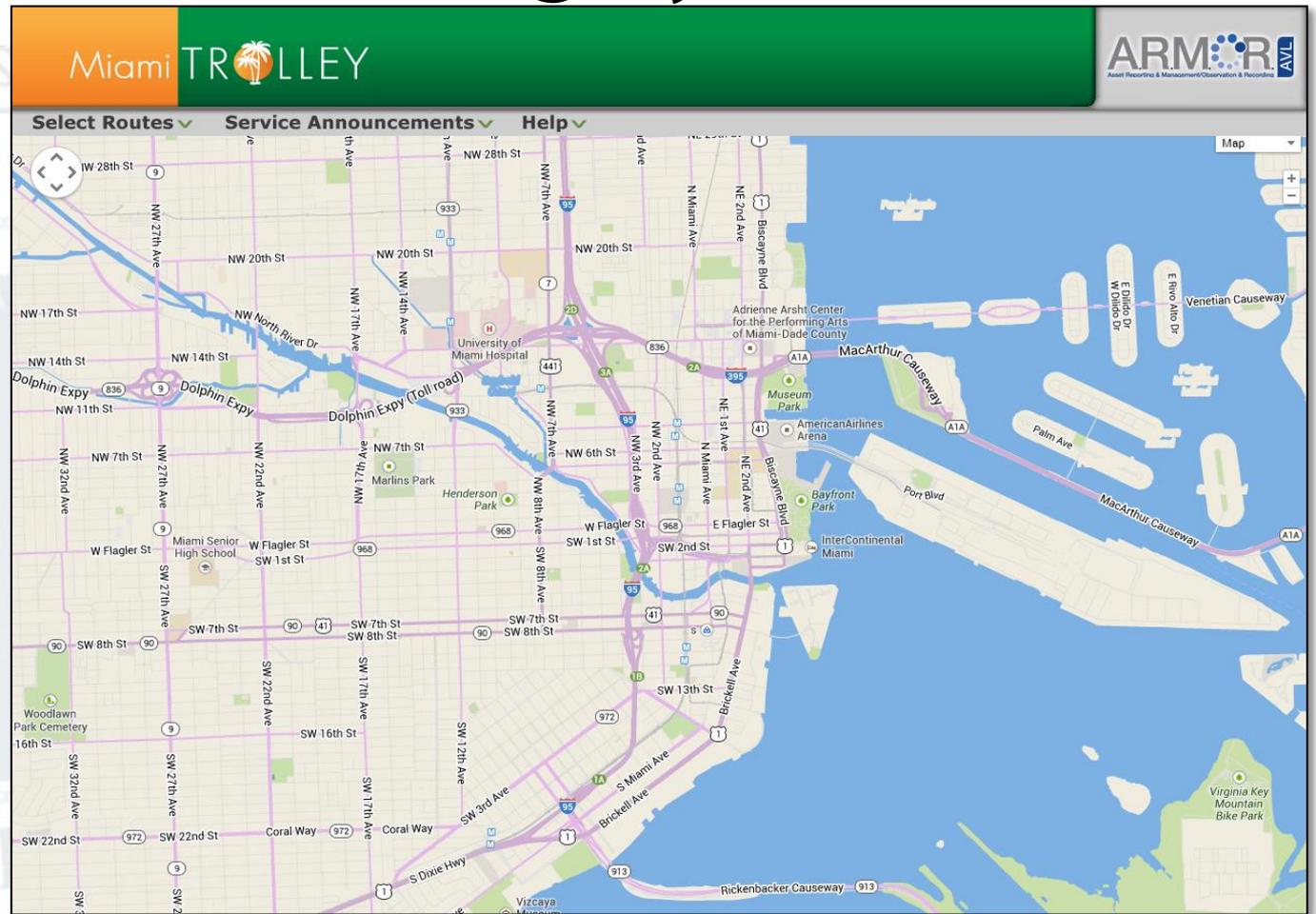


ITS Applied to Transit

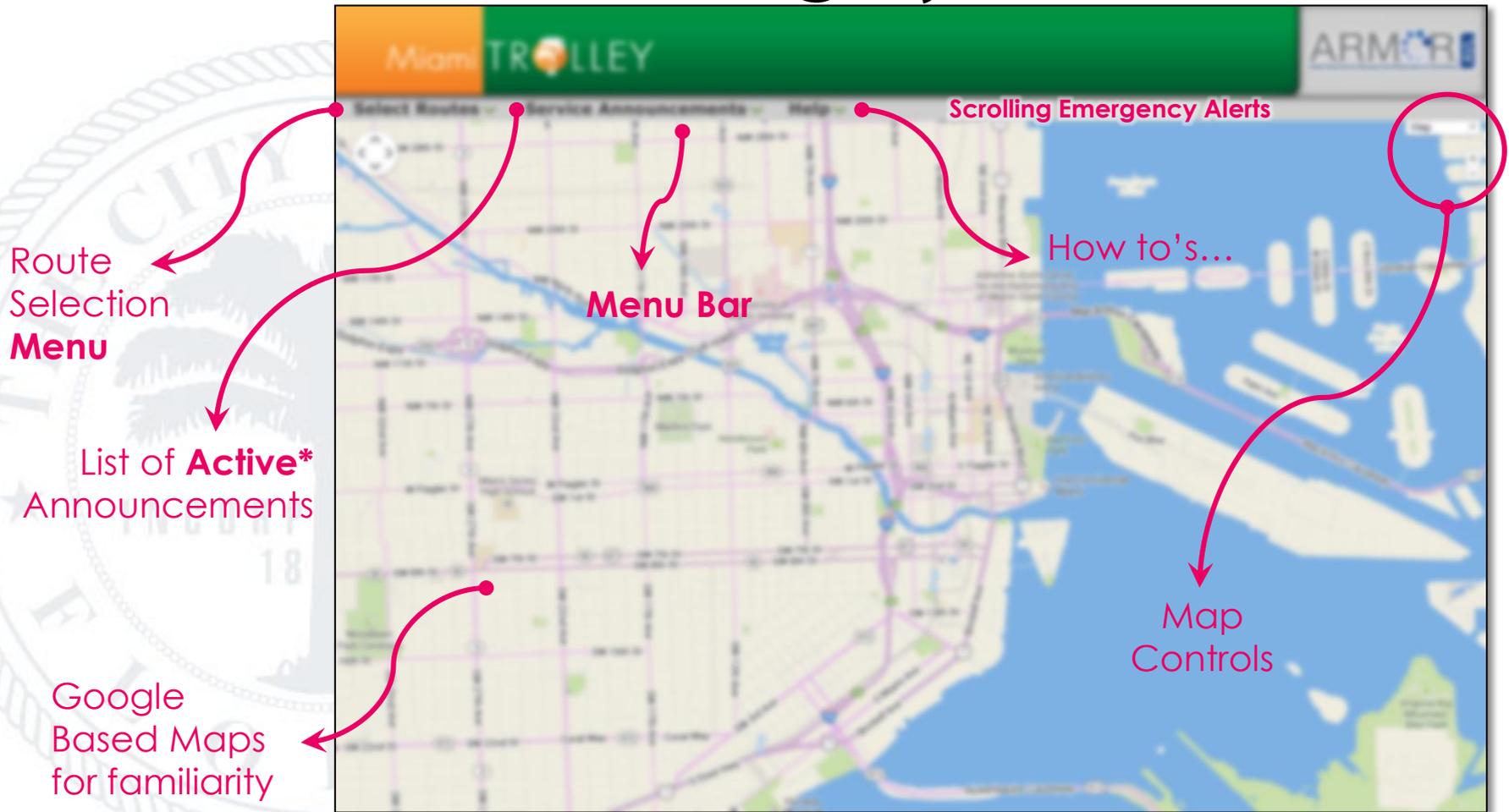
- **Enhance** system reliability with Computer Aided Dispatch and Automatic Vehicle Location (**CAD/AVL**)
- **Web-based** tracking system with Estimated Time of Arrival (**ETA**) for all Miami Trolley Stops



Web-Based Tracking System



Web-Based Tracking System



*Emergency Alerts will be Broadcasted and "Pushed" on the Message Bar



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Web-Based Tracking System

Miami TROLLEY

ARMOR

Select Routes Service Announcements Help

Allapattah Biscayne Brickell Coral Way Health District Overtown

Stadium Select All

SE 15 Rd (NB)

Bus#	ETA
2009	2 min
2022	25 min
2021	55 min
2029	1 hr 9 min

Brickell

Real-Time Vehicle Location

Estimated Time of Arrival for each Stop

Geo-Coded Stop Locations

Route Selection Menu

Selected Route will center on screen

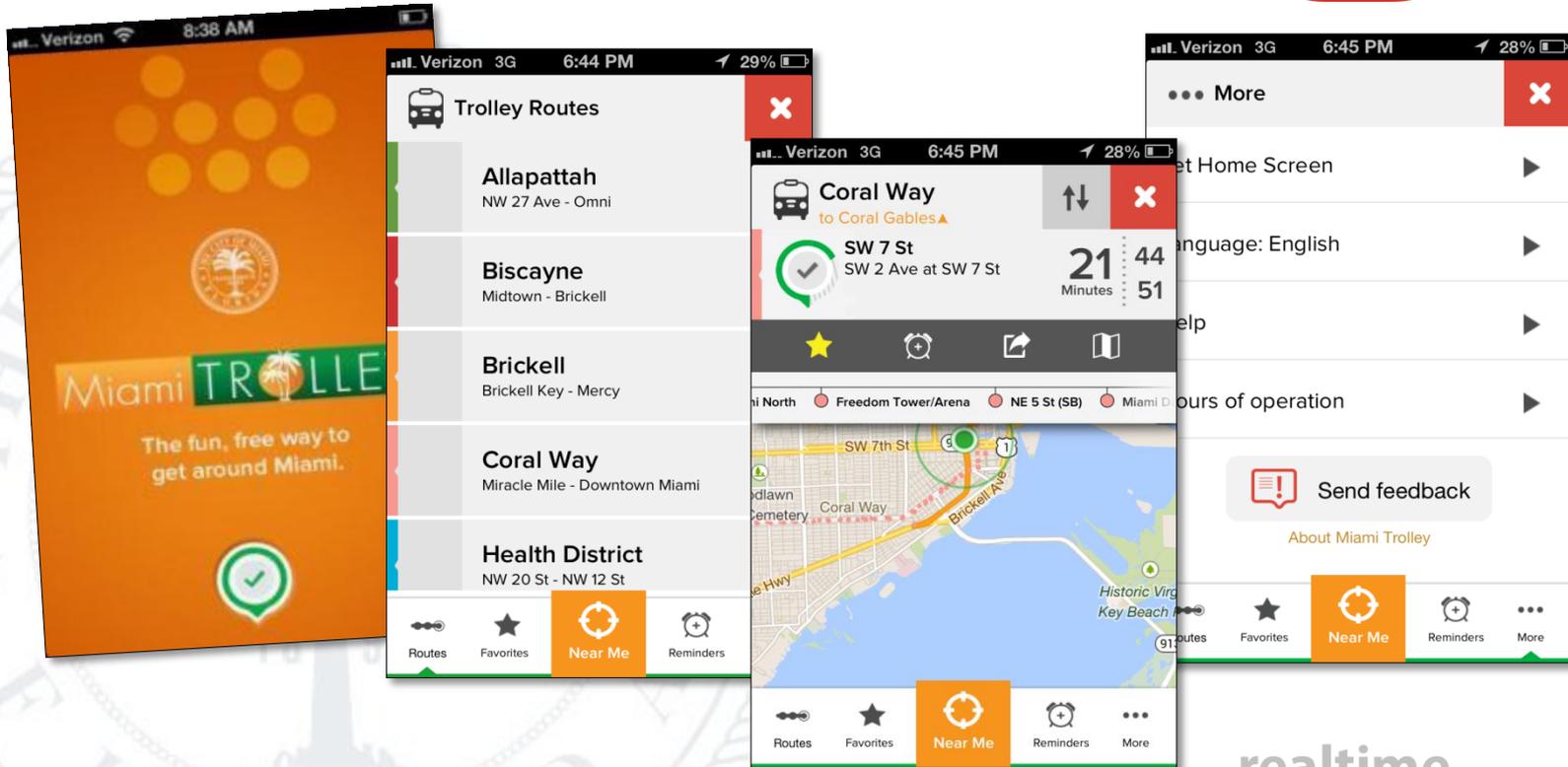
Real-Time Vehicle Location

Estimated Time of Arrival for each Stop

Geo-Coded Stop Locations



Smartphone App



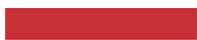
- **ETA** at desired stop
- Map and list views for **easy** access
- Set **reminders** and other features

realtime
Miami Trolley
mobile application

CAD/AVL

The screenshot displays a CAD/AVL software interface. On the left, there is a navigation menu with options like Allapattah, Biscayne, Brickell, Coral Way, Health District, Overtown, Stadium, and No Route. Below the menu are fields for Vehicle Number and Vehicle ID, and a table with columns for Mile Marker, Speed, Acceleration, Latitude, Longitude, Next Stop, and ETA. The main area is a map of Miami with a red route highlighted. A data table at the bottom right shows vehicle data with columns for Vehicle Number, Vehicle ID, Mile Marker, Speed, Next Stop, ETA, Status, Delay Reason, and Last Comment.

Vehicle Number	Vehicle ID	Mile Marker	Speed	Next Stop	ETA	Status	Delay Reason	Last Comment
NR	NIS	2007	0.09401	0	--	--	Not in service	
NR	NIS	2005	0.23522	0	--	--	Not in service	
HDI	HDI_M3	2004	1.76537	0	Sylvester UM	4:36 PM	In Service	
NR	BNLoop	2024	5.43944	32	--	--	In Service	
BIS	BIS_M12	2034	6.18947	0	NE 29 St	4:36 PM	In Service	
COR	COR_M9	2031	7.59611	0	Merrick Way	4:38 PM	In Service	
STA	STA_M3	2017	2.85291	10	Courthouse	4:40 PM	In Service	
ALL	ALL_M9	2011	2.49263	10	NW 14 Ave (L	4:36 PM	In Service	
ALL	ALL_M9	2008	5.87195	0	NW 8 Ave (EE	4:37 PM	In service - at stop	
NR	ALPLoop	2033	0.04562	24	--	--	In Service	
COR	COR_M11	2028	9.60347	0	SW 25 Ave (E	4:37 PM	In service - at stop	



CAD/AVL

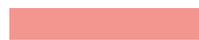
Access to Reporting and Route-setting options

Route Selection Menu

Selected Route will center on screen

Systemwide vehicle location summary

Vehicle Number	Vehicle ID	Mile Marker	Speed	Next Stop	ETA	Status	Delay Reason	Last Comment
101	101_01	0.00000	0	--	--	Not in service		
102	102_01	0.00000	0	--	--	Not in service		
103	103_01	1.76037	0	Schwartz Ln	4:28 PM	To Service		
104	104_01	2.41094	32			To Service		
105	105_01	4.00047	0	101 St St	4:28 PM	To Service		
106	106_01	7.00000	0	Parsons Way	4:28 PM	To Service		
107	107_01	2.40290	10	Clayton Ave	4:40 PM	To Service		
108	108_01	2.40000	32	101 St St	4:28 PM	To Service		
109	109_01	5.87188	0	101 St St	4:27 PM	To Service - at stop		
110	110_01	2.40000	32			To Service		
111	111_01	4.00047	0	101 St St	4:27 PM	To Service - at stop		



CAD/AVL

The screenshot displays a web-based CAD/AVL interface. On the left, a sidebar lists districts: Allapattah, Biscayne, Brickell, Coral Way, Health District, Overtown, Stadium, and No Route. The 'Brickell' district is highlighted. Below this, a 'Selected Vehicle Information Highlighted' callout points to a table with fields: Vehicle Number, Vehicle ID, Mile Marker, Speed, Acceleration, Latitude, Longitude, Next Stop, and ETA. The main map shows a street grid with several red and orange geofences. A 'Create, Edit, and Show Geofences' callout points to a red geofence line. Another callout, 'Vehicle ID, Speed, Next Stop, ETA, Vehicle Status', points to the data table. The table has columns: Vehicle Number, Vehicle ID, Mile Marker, Speed, Next Stop, ETA, Status, Delay Reason, and Last Comment. The ARMOR logo is at the bottom left of the interface.

	Vehicle Number	Vehicle ID	Mile Marker	Speed	Next Stop	ETA	Status	Delay Reason	Last Comment
NR	NIS	2007	0.09401	0	--	--	Not in service		
NR	NIS	2005	0.23522	0	--	--	Not in service		
HDI	HDI_M3	2004	1.76537	0	Sylvester UM	4:36 PM	In Service		
NR	BNLoop	2024	5.43944	32	--	--	In Service		
BIS	BIS_M12	2034	6.18947	0	NE 29 St	4:36 PM	In Service		
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NR	ALPLoop	2033	0.04562	24	--	--	In Service		
COR	COR_M11	2028	9.60347	0	SW 25 Ave (E	4:37 PM	In service - at stop		

Selected Vehicle Information Highlighted

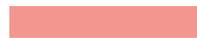
Create, Edit, and Show Geofences

Vehicle ID, Speed, Next Stop, ETA, Vehicle Status

CAD/AVL - REPORTS

The screenshot displays a web-based CAD/AVL interface. On the left, a sidebar contains a 'Graphical Reports' menu with options like 'Vehicle History By ID', 'Speed Infraction By ID', and 'Stop Heat Maps'. Below this is a 'Vehicle History By ID' section with filters for 'Start Date', 'Start Time', 'End Date', 'End Time', and 'Vehicle ID'. A 'Run Report' button is at the bottom of the sidebar. The main area features a map of Miami with a red route and several alert icons (green, red, blue, purple, orange) overlaid. Below the map is a table of alerts.

Alert	Date	Latitude	Longitude	Speed	Alert Data
	Jul 23 2014 7:00:05 AM	25.79854	-80.18909	19	
	Jul 23 2014 7:00:16 AM	25.79933	-80.18913	15	
	Jul 23 2014 7:00:31 AM	25.79972	-80.18914	0	
	Jul 23 2014 7:00:51 AM	25.80069	-80.18918	15	
	Jul 23 2014 7:01:02 AM	25.80118	-80.18920	4	
	Jul 23 2014 7:01:07 AM	25.80119	-80.18920	3	
	Jul 23 2014 7:01:28 AM	25.80238	-80.18925	21	
	Jul 23 2014 7:01:38 AM	25.80322	-80.18925	21	
	Jul 23 2014 7:01:49 AM	25.80401	-80.18932	14	
	Jul 23 2014 7:02:10 AM	25.80429	-80.19003	12	
	Jul 23 2014 7:02:24 AM			11	



CAD/AVL - REPORTS

Vehicle History by ID



Report Parameters:
Date
Time
Vehicle Number



The screenshot shows a software interface for CAD/AVL reports. On the left is a navigation menu with 'Graphical Reports' and 'Tabular Reports' sections. The 'Graphical Reports' section includes 'Vehicle History By ID', 'Speed Infraction By ID', 'Stop Heat Maps', 'Speed Fence Violations', 'Passenger Access By Route', 'Boundary Fence Activity By Class', 'Vehicle Proximity To Location', and 'Vehicle Proximity To Station'. The 'Tabular Reports' section includes 'Arrivals - Departures by Date', 'Vehicle Set Route', 'Vehicle History By ID Tabular', 'Passenger Counts By Vehicle', and 'Passenger Counts By Route'. Below the menu is a 'Vehicle History By ID' form with fields for 'Start Date' (07/23/2014), 'Start Time' (7:00 AM), 'End Date' (07/23/2014), 'End Time' (5:00 PM), and 'Vehicle ID' (2034). A 'Run Report' button is at the bottom of the form. The main area is a map of Miami showing a route with various colored segments. Below the map are buttons for 'Ignition On', 'Ignition Off', 'Enter Geofence', 'Exit Geofence', and 'Excessive Speed'. At the bottom is a table of alerts.

Alert	Date	Latitude	Longitude	Speed	Alert Data
	Jul 23 2014 7:00:05 AM	25.79854	-80.18909	19	
	Jul 23 2014 7:00:16 AM	25.79933	-80.18913	15	
	Jul 23 2014 7:00:31 AM	25.79972	-80.18914	0	
	Jul 23 2014 7:00:51 AM	25.80069	-80.18918	15	
	Jul 23 2014 7:01:02 AM	25.80118	-80.18920	4	
	Jul 23 2014 7:01:07 AM	25.80119	-80.18920	3	
	Jul 23 2014 7:01:28 AM	25.80238	-80.18925	21	
	Jul 23 2014 7:01:38 AM	25.80322	-80.18925	21	
	Jul 23 2014 7:01:49 AM	25.80401	-80.19003	14	
	Jul 23 2014 7:02:10 AM	25.80429	-80.19003	12	
	Jul 23 2014 7:02:24 AM			11	



CAD/AVL - REPORTS

Data Can be Exported to PDF or Excel

Detailed Map of Route Traveled

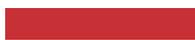
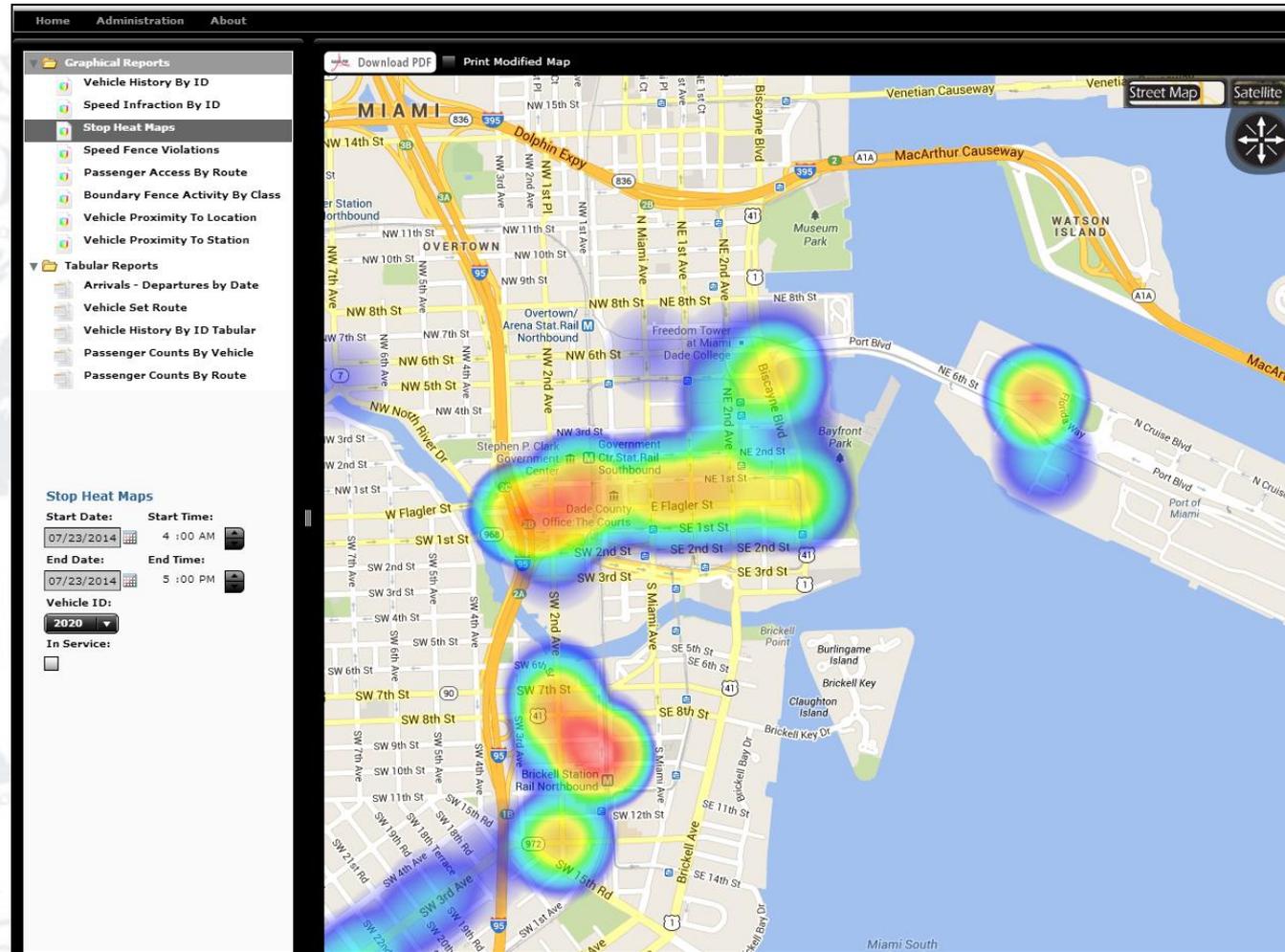
The screenshot displays a web-based CAD/AVL reporting interface. On the left is a sidebar menu with categories like 'Graphical Reports' and 'Tabular Reports'. The main area shows a map of Miami with a red route line. A 'Vehicle History By ID' section is visible, showing filters for start/end dates and vehicle ID. At the bottom, there are status indicators for 'Ignition On', 'Ignition Off', 'Geofence', and 'Excessive Speed', along with a table of alert data.

Speed, Next Stop, ETA, Vehicle Status

Alert	Date	Latitude	Longitude	Speed	Alert Data
	Jul 23 2014 7:00:05 AM	25.79854	-80.18909	19	
	Jul 23 2014 7:00:16 AM	25.79933	-80.18913	15	
	Jul 23 2014 7:00:31 AM	25.79972	-80.18914	0	
	Jul 23 2014 7:00:51 AM	25.80069	-80.18918	15	
	Jul 23 2014 7:01:02 AM	25.80118	-80.18920	4	
	Jul 23 2014 7:01:07 AM	25.80119	-80.18920	3	
	Jul 23 2014 7:01:28 AM	25.80238	-80.18925	21	
	Jul 23 2014 7:01:38 AM	25.80322	-80.18925	21	
	Jul 23 2014 7:01:49 AM	25.80401	-80.18932	14	
	Jul 23 2014 7:02:10 AM	25.80429	-80.19003	12	
	Jul 23 2014 7:02:24 AM			11	



CAD/AVL - REPORTS



CAD/AVL - REPORTS

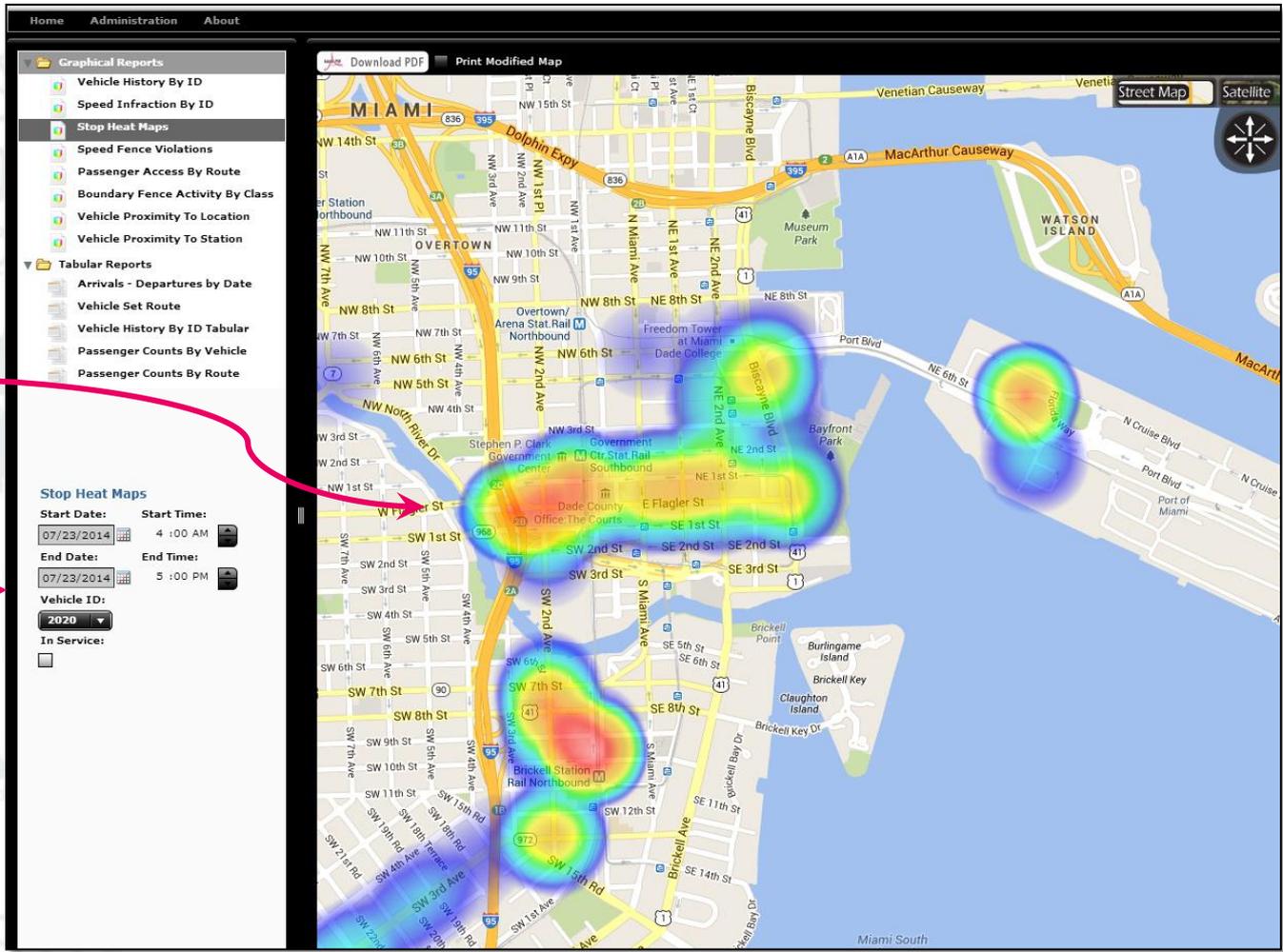
Stop Heat Maps



Heat map indicates amount of dwell time at stop

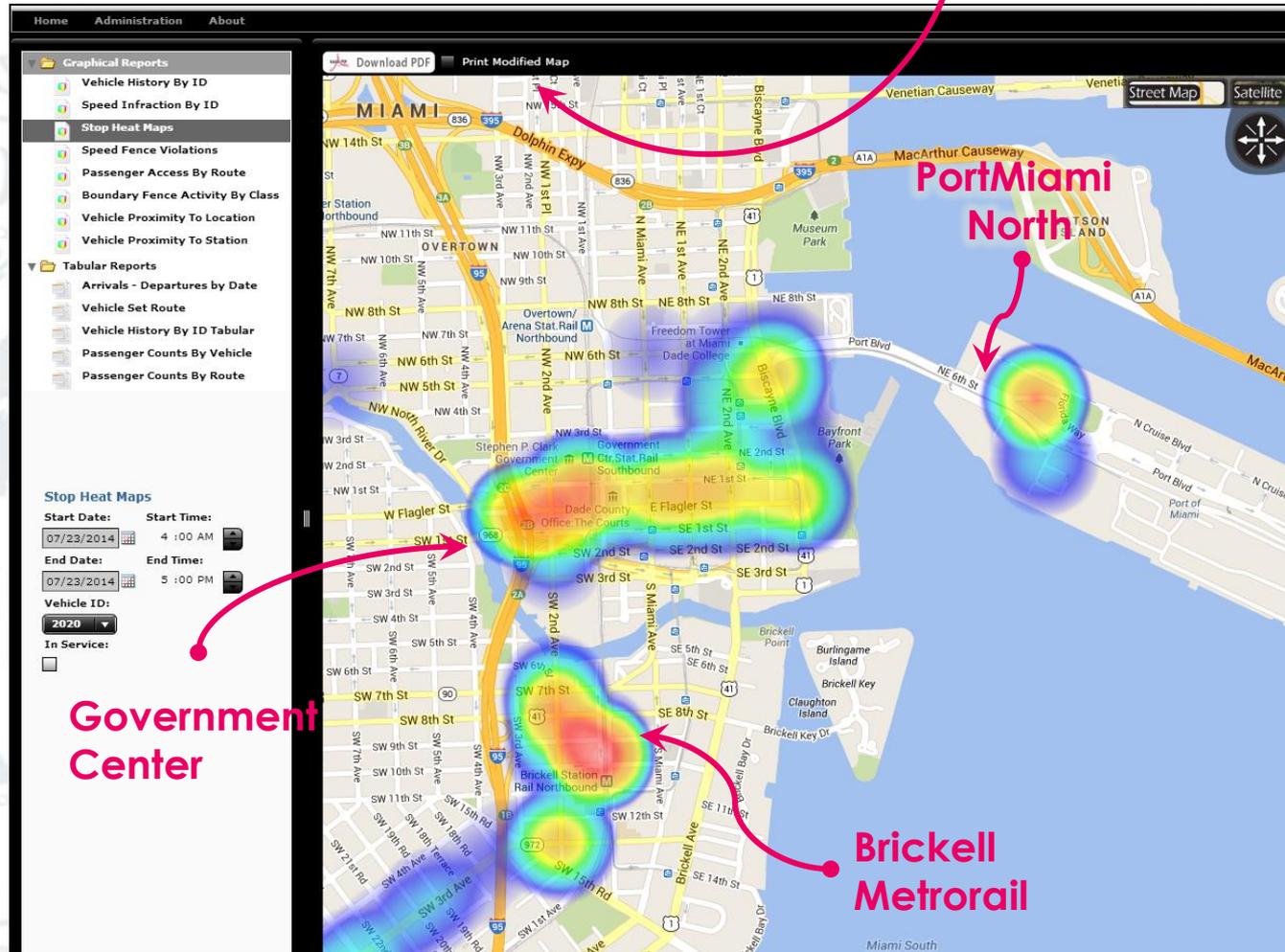


Report Parameters:
Date
Time
Vehicle Number

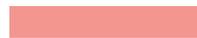


CAD/AVL - REPORTS

Data Can be Exported to PDF or Excel



July 2014



CAD/AVL - REPORTS

Data Can be Exported to PDF or Excel

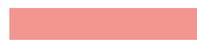
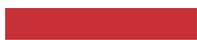
Boundary Fence Activity

Geofence-activated report

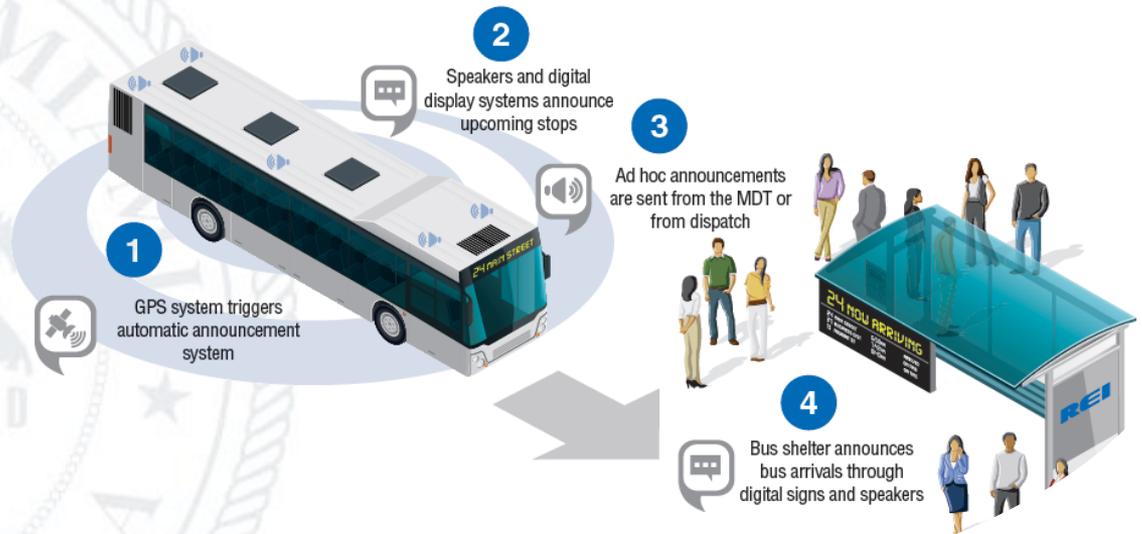
Report Parameters:
Date
Time
Vehicle Number

The screenshot shows a software interface with a sidebar menu on the left and a main map area on the right. The sidebar menu includes sections for 'Graphical Reports' (Vehicle History By ID, Speed Infraction By ID, Stop Heat Maps, Speed Fence Violations, Passenger Access By Route, Boundary Fence Activity By Class, Vehicle Proximity To Location, Vehicle Proximity To Station) and 'Tabular Reports' (Arrivals - Departures by Date, Vehicle Set Route, Vehicle History By ID Tabular, Passenger Counts By Vehicle, Passenger Counts By Route). Below the menu is a 'Boundary Fence Activity By Class' section with fields for Start Date (07/23/2014), Start Time (4:00 AM), End Date (07/23/2014), End Time (7:00 AM), and a dropdown for Boundary Fence Classification (Garage). A 'Run Report' button is at the bottom of the sidebar. The map area shows a street grid with a blue polygon representing a geofence. A red arrow points from the text 'Data Can be Exported to PDF or Excel' to the 'Download PDF' and 'Download CSV' buttons at the top of the map. Another red arrow points from 'Boundary Fence Activity' to the 'Boundary Fence Activity By Class' section. A third red arrow points from 'Geofence-activated report' to the blue polygon on the map. A fourth red arrow points from 'Report Parameters: Date Time Vehicle Number' to the date and time fields. A fifth red arrow points from 'Check-out from Geofence point' to the blue polygon. The map also shows an 'Excessive Speed' warning icon. At the bottom of the map is a table with the following data:

Date	Vehicle ID	Driver	Fence Violated
Jul 23 2014 6:21:18 AM	2001		Keolis Yard
Jul 23 2014 6:18:32 AM	2002		Keolis Yard
Jul 23 2014 6:20:16 AM	2003		Keolis Yard
Jul 23 2014 6:19:55 AM	2003		Keolis Yard
Jul 23 2014 6:17:27 AM	2003		Keolis Yard
Jul 23 2014 6:16:55 AM	2004		Keolis Yard
Jul 23 2014 6:13:08 AM	2006		Keolis Yard
Jul 23 2014 6:12:36 AM	2006		Keolis Yard
Jul 23 2014 6:46:52 AM	2007		Keolis Yard
Jul 23 2014 6:18:39 AM	2008		Keolis Yard
Jul 23 2014 5:48:19 AM	2009		Keolis Yard



Next Steps...



- Automatic Voice and Text Announcement System (**AVTAS**) implementation to comply with ADA stop announcement requirements

LET'S START BY CHANGING THE WAY WE THINK ABOUT **TRANSPORTATION**

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Capital Improvements
and Transportation Program