



Intelligent Transportation Systems (ITS)

Radio Communications and CAD/AVL Upgrade



History of Current Radio System

- Procurement started in 1999
- Aging system with obsolete technology
 - Many parts are no longer sold and difficult to purchase/repair
- As parts fail, the radio coverage declines
 - Loss of communication with operators and supervisors (rail and bus)
 - Loss of visual location of each vehicle





Project Funding

- Federal Highway Administration awarded RTA a competitive \$11.6 million (50/50) grant
- RTA has allocated \$2.64 million of FTA formula funds (80/20)
- NOACA awarded \$760,000 of section 5310 funds (80/20)





Project Schedule

Task	Completion Date
Dispatch Center Replacement	Complete
Begin using MARCS (portables)	Complete
WLAN Installation (Fixed Route)	Complete
Bus-in-Box Arrival (test units)	Complete
Proof of Concept	Complete
Pilot Begins	Complete
Paratransit Fleet Installation	Complete
FR Fleet Installation	Complete
Rail Fleet Installation	April - Fall 2020





Three Pillars of the Project:

1. Radio Replacement

- Vehicle, handheld and dispatch consoles

2. ITS Computer Equipment

- Vehicle computers, routers, Wi-Fi, customer data

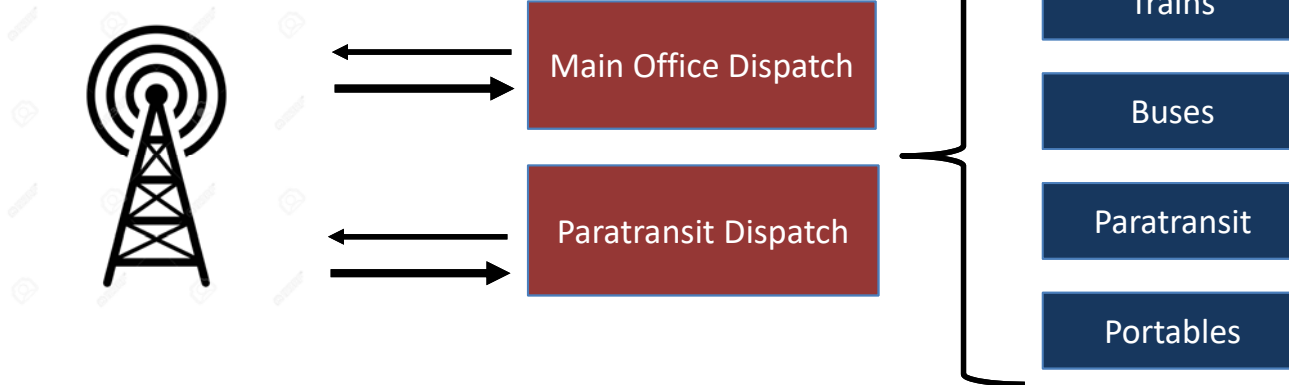
3. Radio and Cellular Service

- Agreements with radio and cellular providers



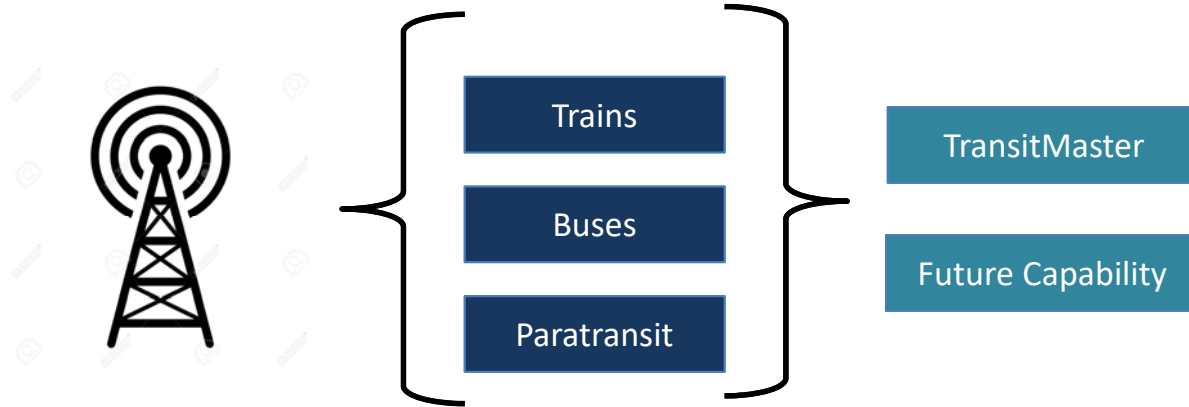


Radio Network



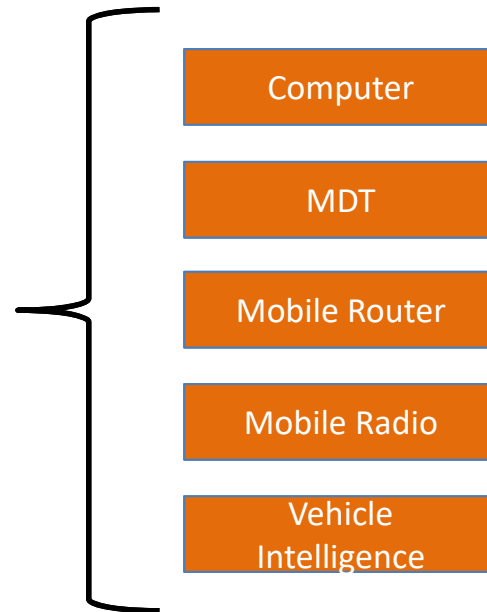


Cellular Network





ITS Computer Equipment





Key New Features

Feature	Current Technology	Enhanced Technology
Vehicle Alarms	Covert alarms are audio only.	Coverts alarms are audio and visual (Future). The visual video will allow RTA to perform a live look into the vehicle.
Priority Cellular Service	No cellular service	With FirstNet, if there is a major event or catastrophe, RTA has priority over the public. Our cell service won't slow-down/go out due to high capacity
Radio Communication	4 Radio Tower with significant coverage gaps	13 towers that covers the entire county and utilizes towers across the state. RTA utilizes the state's MARCS system created for 1 st responders. RTA can now communicate with 1 st responders in the event of an emergency.
Paratransit Contractors	No direct communication or scheduling of vehicles	Direct scheduling of manifests with contractors. Each contractor has a tablet with software application managed by RTA dispatchers.





Key New Features

Feature	Current Technology	Enhanced Technology
Navigation	No navigation available. Route books and maps are utilized.	Turn-by-turn navigation including re-routes, special events, etc.
Pre-Trip Inspection	Operators review their vehicle and complete paper forms for defects.	Operator performs the inspection (paperless) on the new vehicle tablet (future)
Predictive Maintenance	Limited monitoring tools	Real-time predictive maintenance and monitoring of vehicle components. This allows RTA to monitor vehicles and inform operators/maintenance of errors before the vehicle breaks down.
Vehicle Location	Poll rate = 1 minute	Poll rate = 15 seconds Reliable real-time data for Transit App
Equipment Maintenance	No maintenance available due to obsolete parts	Long-term maintenance contracts with all vendors



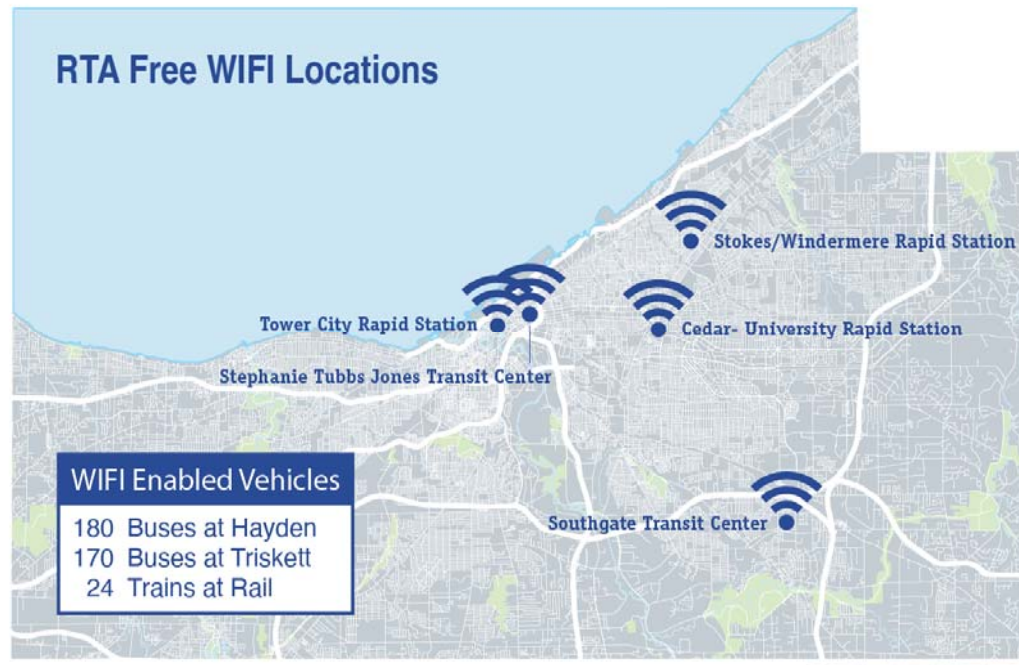
Key New Features

Feature	Current Technology	Enhanced Technology
Wi-Fi	No Wi-Fi	Complimentary Wi-Fi on all RTA buses and trains
Enhanced Data	Significant loss of reliable data	<p>Accurate data including, but not limited to ridership, cellular usage, real-time information, vehicle diagnostics, etc.</p> <p><u>Fields Available for App Developers:</u></p> <ol style="list-style-type: none"> 1. Vehicle Number 2. Vehicle Latitude and Longitude 3. Vehicle Odometer 4. Vehicle Speed 5. Vehicle Type 6. Vehicle Position 7. Trip Updates 8. Alert and Delay Updates 9. Stop Time Updates 10. Bus Load/Bus Load % (Coming soon)



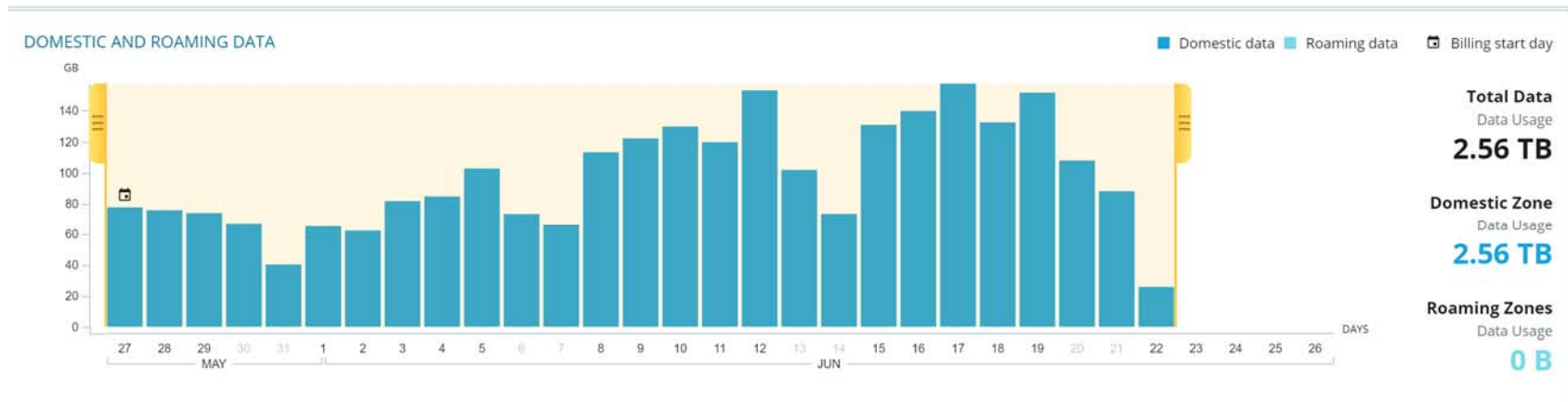
Civic Technology

Goal: Provide key technology and data to enhance our community





Civic Technology - Public Wi-Fi Usage

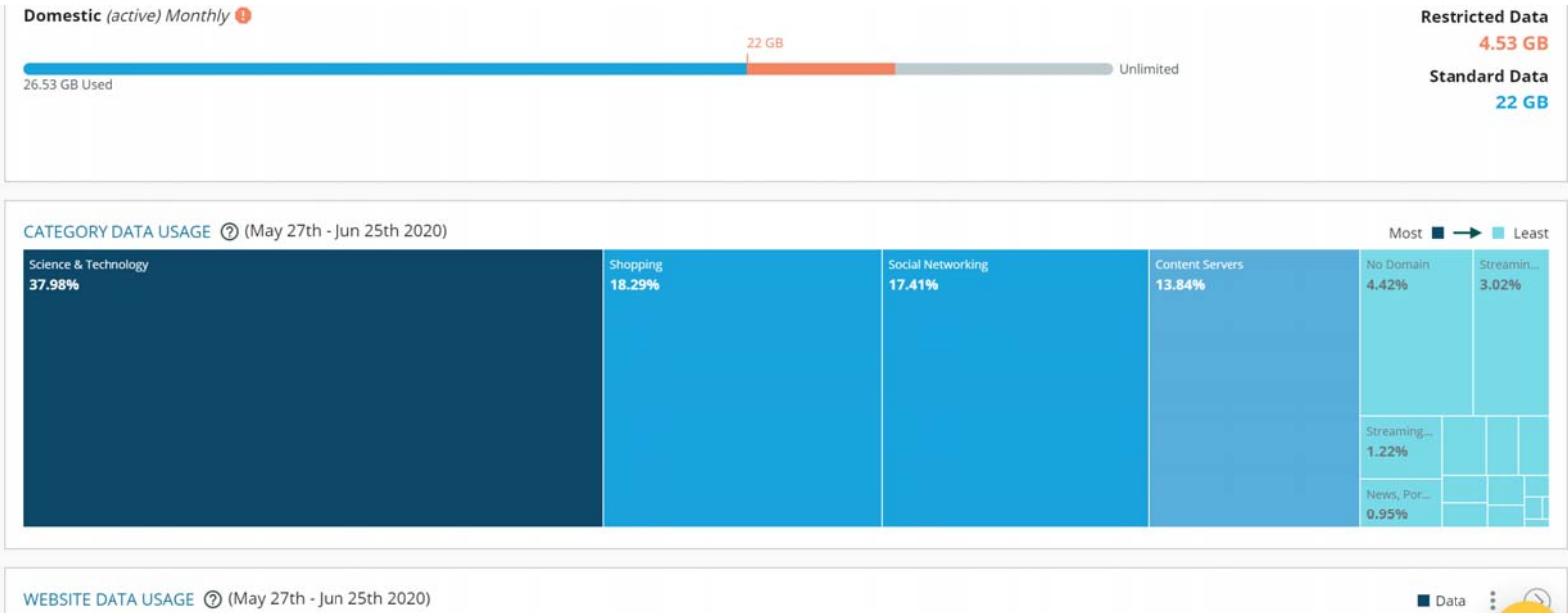


DEVICE DATA USAGE ⓘ (May 27th - Jun 22nd 2020)

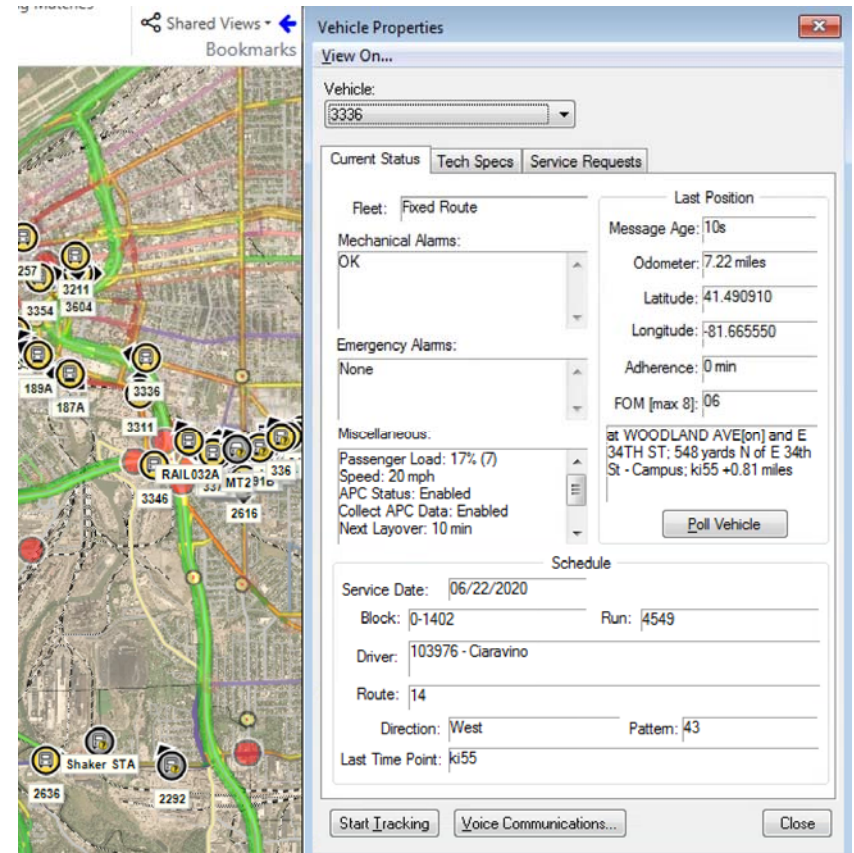
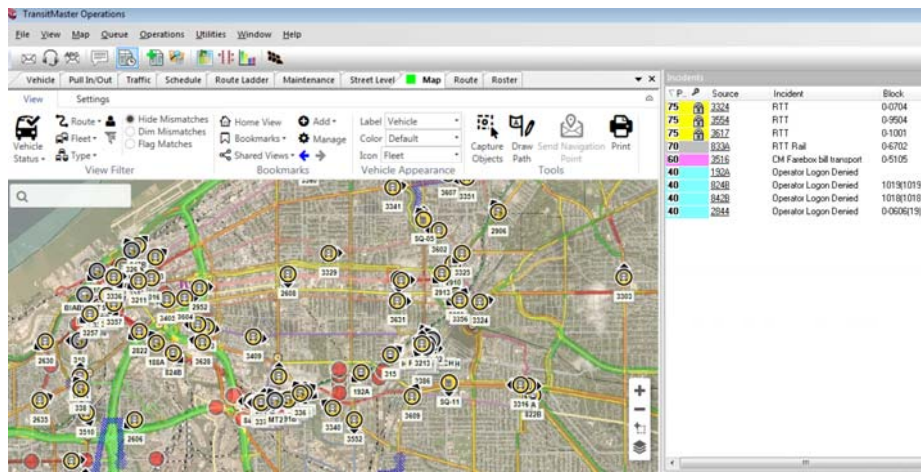
Name (Top 10)	GB	%	Restriction	GB	5	10	15	20	25
2917	26.49	(1.01%)	ⓘ	26.49	5	10	15	20	25
3350	22.92	(0.88%)	ⓘ	22.92	5	10	15	20	25
3510	22.79	(0.87%)	ⓘ	22.79	5	10	15	20	25
2916	21.53	(0.82%)		21.53	5	10	15	20	25
3379	21.47	(0.82%)		21.47	5	10	15	20	25
2952	21.45	(0.82%)		21.45	5	10	15	20	25
3202	20.00	(0.80%)		20.00	5	10	15	20	25



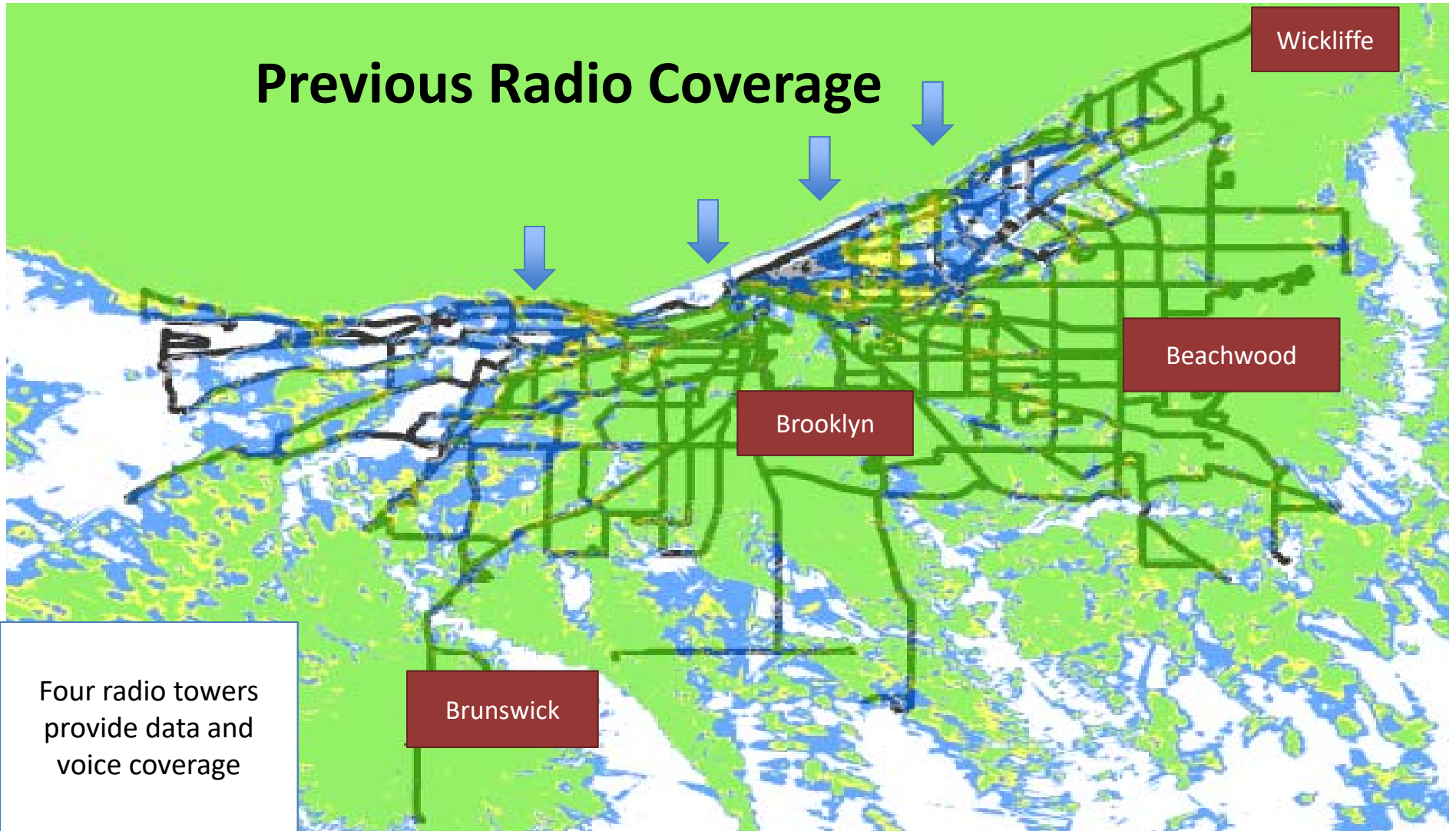
Civic Technology - Public Wi-Fi Usage



TransitMaster Internal Management of Buses/Trains

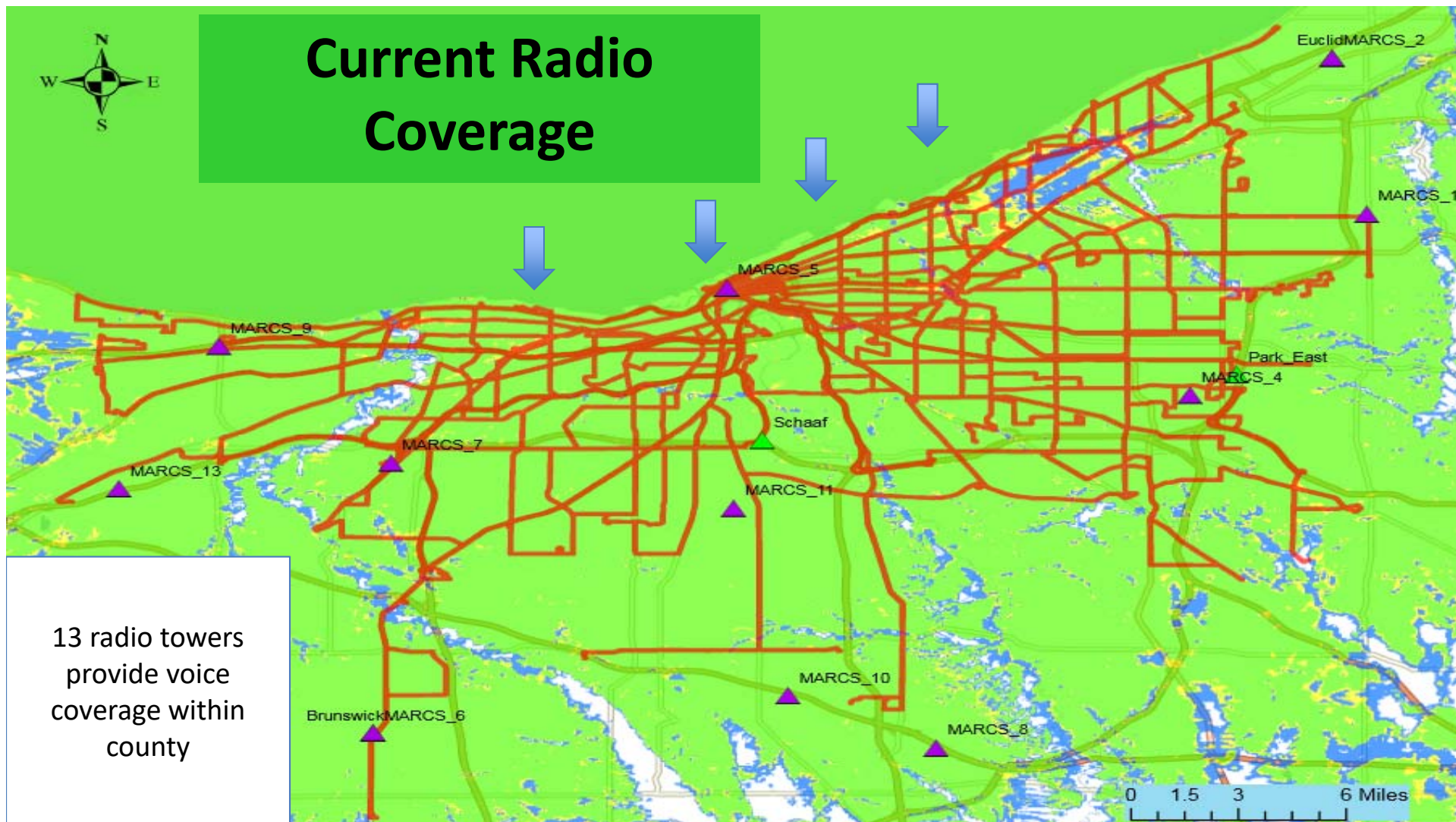


Previous Radio Coverage





Current Radio Coverage

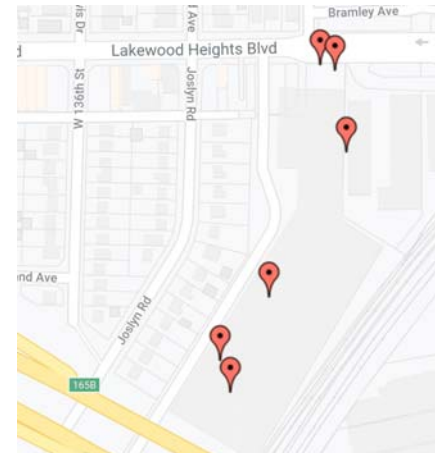


13 radio towers provide voice coverage within county

0 1.5 3 6 Miles



Telematics: Vehicle Intelligence



Utilization Report - Monthly

Refreshed on Thu, Nov 07, 2019 at 08:37:26 AM Eastern Standard Time

Name	Engine (hr)	Fuel (gal)	Odometer (mi)	Idle (hr)	Idle Fuel (gal)	% Idle (%)
1704	6,772	25,389.84	104,629.5	1,832.45	-	27.06
1801	15,305.2	55,160.71	258,955.05	5,856.05	-	38.26
2829	21,599.85	21,401.9	222,116.2	3,259.6	-	15.09

Greater Cleveland Regional Transit Authority



Fixed Route Navigation





Programming Radios



670 Mobile Radios



225 Portable Radios





Programming Tablets/Routers



110 Paratransit Tablets



500 Mobile Routers





Equipment Storage and Wi-Fi

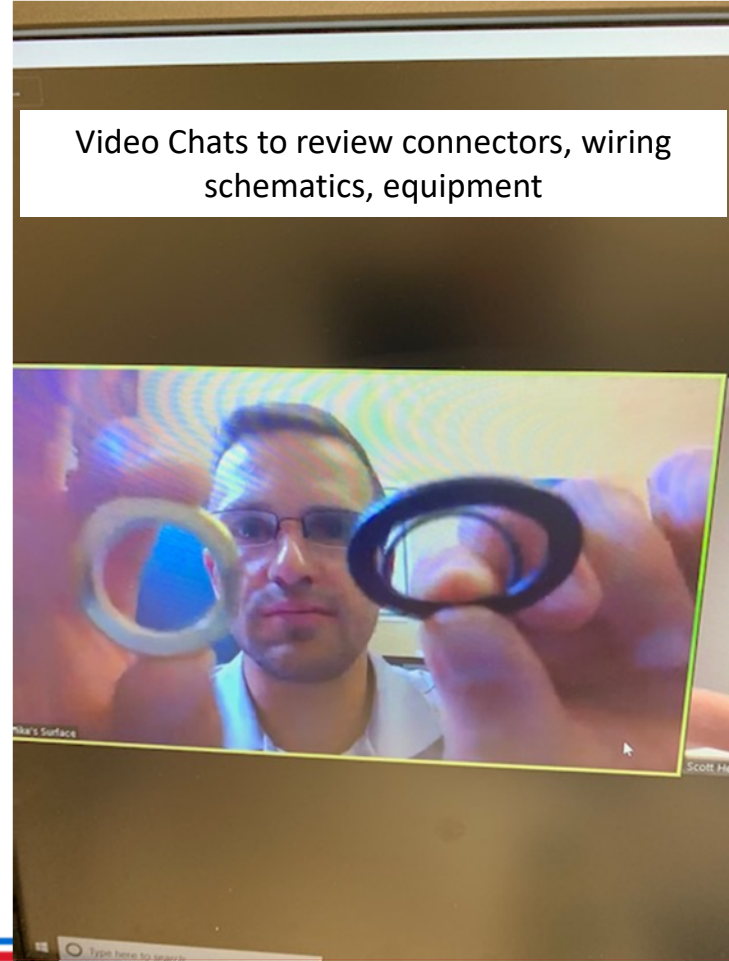




Gre



Bus Pilot Program



Video Chats to review connectors, wiring schematics, equipment



Gr



Bus-in-a-Box Training



Lead Installation Crew

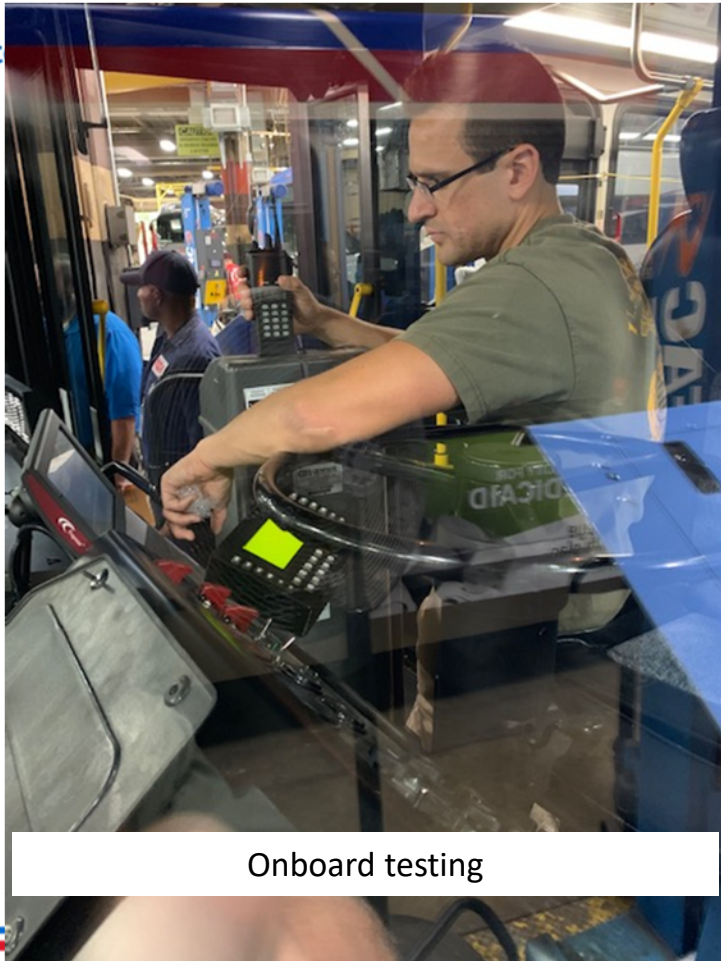
Mobile Office for Project



Each Bus gets 3 new Antennas



Great



Onboard testing



Install new Rail Equipment



Greater



Paratransit Installation



Equipment Staging area at Hayden





New Operator MDT Screen



New Bus Cabinet Layout



Heavy Rail Train Installation



Heavy Rail Train Installation

