Town of Hilton Head Island

Adaptive Traffic Signal Management System Update

Town Council
October 22, 2024

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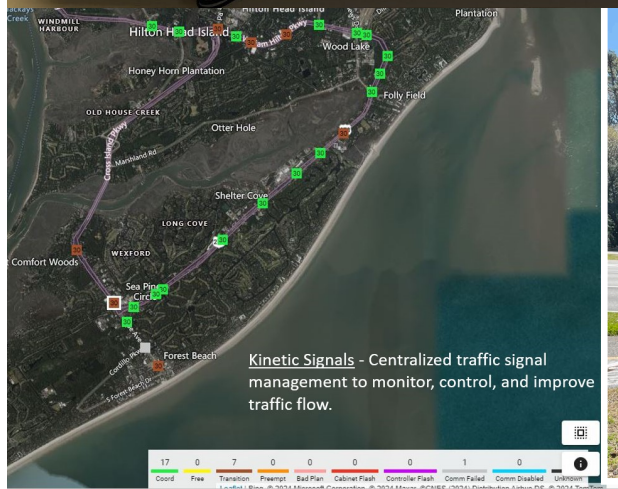
Assistant Town Manager

Update Overview

- Project Goals and Objectives
- It IS Adaptive
- Before and After Results
- Improvements to System Functionality
- Proactive Continuous Improvements
- Fiber Optic Communications
- Windmill Harbor Signal
- Contacting Us
- Questions

Project Goals and Objectives

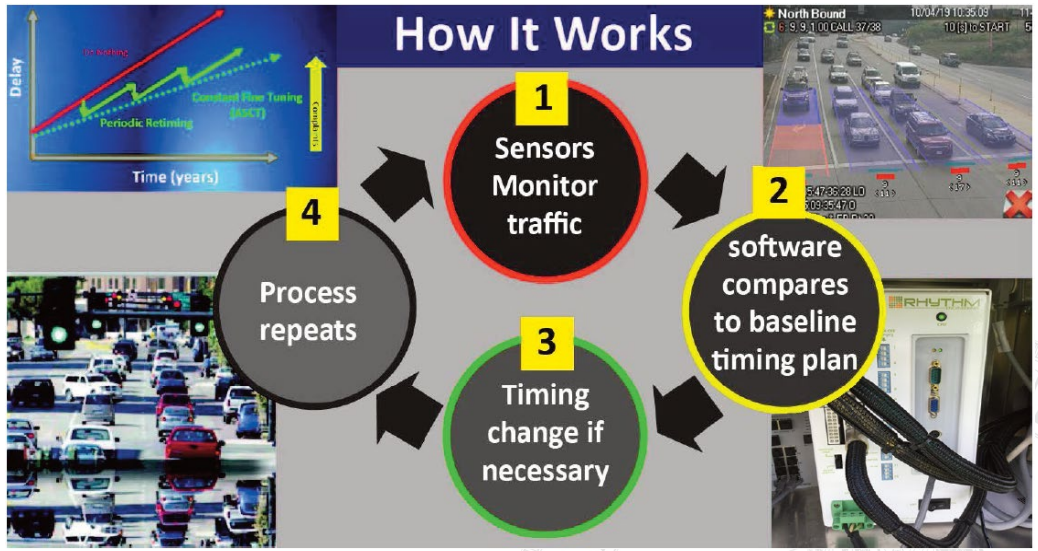
- Improved the reliability of travel along the project corridors at all times of day
- Maintained a consistent level of service along the project corridors during peak hour operations
- Staff can manage and monitor the traffic signal system remotely in real time
- The system enhanced vehicle detection, communication, and alarm notification
- The project formed a foundation to develop an overall Advanced Traffic Management System (ATMS)



It Is Adaptive

Adaptive Traffic Signal Management (ATSM) technology adjusts the timing of red, yellow and green lights to accommodate changing traffic patterns, ease traffic congestion, and improve safety.

- **Adjusts timing** in **real time** to accommodate traffic patterns
- **Decreases wait time** and **delays** at signalized intersections
- **Reduces emissions** of hydrocarbons and carbon monoxide due to improved traffic flow
- **Reduces congestion** by creating smoother traffic flow
- **Reduces Fuel consumption** by reducing travel times
- **Increases safety** by automatically adapting to unexpected changes in traffic conditions



Adaptive traffic signals use sensors to monitor directional traffic flow, vehicle delay, and queues. This information is used to calculate an optimized traffic signal timing plan. The adaptive algorithm shares the updated timing plan with the traffic signal controller.

Before and After - Results

SCDOT Study states mainline travel times have been reduced by 3%.

Eastbound AM peak

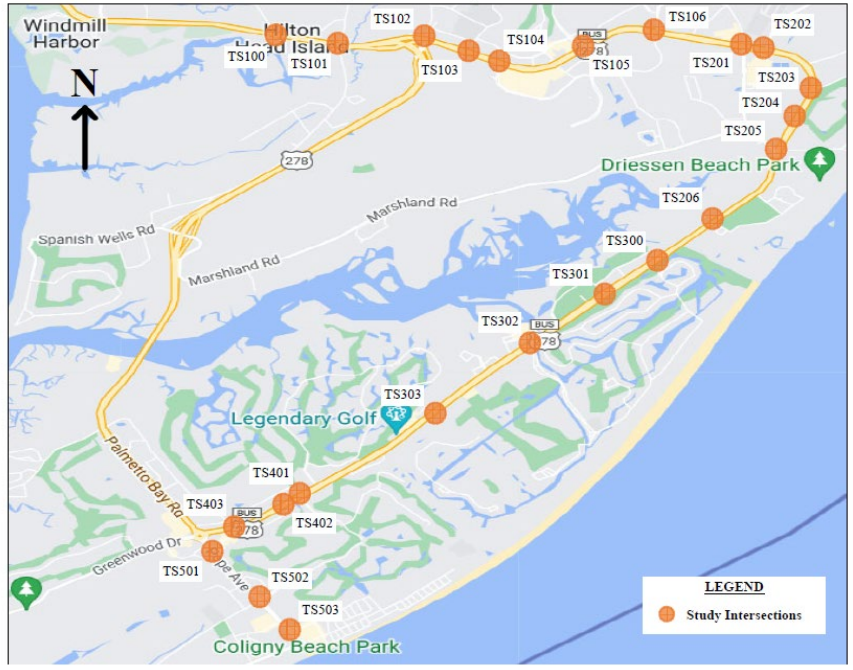
- 36 second travel time reduction (Squire Pope Road to Beach City Road 2.7 miles / Free flow travel time at 45mph is 216 seconds)

- 15 second travel time reduction (Mathews Drive to Queens Way 4.3 miles / Free flow travel time at 45mph is 344 seconds)

Westbound PM peak

- 45 second travel time reduction (Queens Way to Mathews Drive 4.3 miles / Free flow travel time at 45mph is 344 seconds)

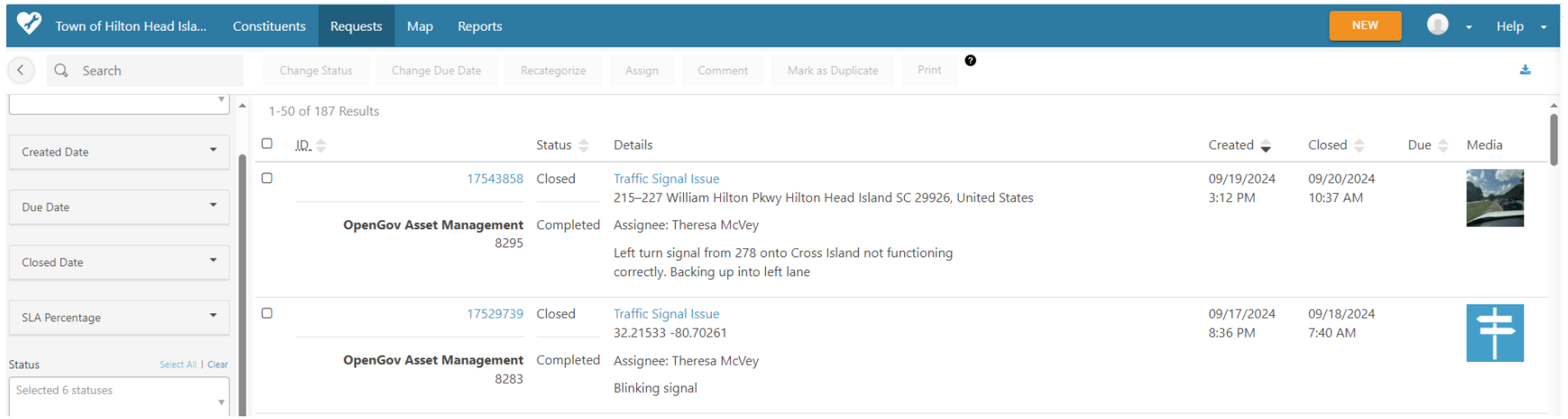
- 8 second travel time reduction (Beach City Road to Squire Pope Road 2.7miles/ Free flow travel time at 45mph is 216 seconds)



Improvements to System Functionality

Overall system functionality has improved dramatically over the last month.

- Staff has seen a reduction in the number of citizen concerns over the last two months. (Phone calls, emails, MyHHI (SeeClickFix) requests down)
  - 10 SeeClickFix requests in July
  - 13 SeeClickFix requests in August
  - 3 SeeClickFix requests in September



Improvements to System Functionality

In August, Town staff worked with adaptive system manufacturer and the contractor to improve operational and equipment resiliency, including the following:

- Installed more reliable grounding to radar equipment
- Improved signal operations through modifying traffic signal controller settings
- Improved radar detection reliability by upgrading the radar firmware
- Improved radar detection by modifying some radar locations
- The system performed well with recent storm events

Proactive Continuous Improvements

Staff has been proactively implementing strategies to increase signal performance.

- Focusing on reducing the probability of short green times
- Examining individual intersections and changing actual inputs to the controller from theoretical inputs to actual “real life” inputs
- Modifying signal system timing to assist with traffic flow for community special events
- Addressing unique vehicle characteristics like school buses

Phase Timing Plans

Phase Plan 1 | Show All Phases | Show All Parameters

Phase	1	2	4	5	6	8
Description	WBL	EB	SB	EBL	WB	NB
Enabled	☑	☑	☑	☑	☑	☑
Walk	0	12	7	0	12	7
Ped Clear	0	22	23	0	13	23
Min Green	4	15	6	6	15	6
Passage	1.5	4.0	2.0	2.0	4.0	2.0
Max 1	15	60	20	25	60	20
Max 2	4	150	10	10	150	10
Yellow Change	3.0	4.3	3.8	3.0	4.3	3.8
Red Clear	3.9	1.8	3.0	3.7	1.8	3.0
Red Revert	0.0	0.0	0.0	0.0	0.0	0.0
Added Initial	1.5	1.5	1.5	1.5	1.5	1.5
Maximum Initial	6	28	12	15	28	12
Time Before Reduction	5	60	10	15	60	10
Time To Reduce	3	60	4	15	60	4
Minimum Gap	1.0	2.3	1.0	1.0	2.3	1.0
Walk 2	0	15	10	0	15	10

Proactive Continuous Improvements

- Assessing the system's core timing parameters and make other recommendations for the signal system that go beyond implementation of Adaptive System Technology
- Updating surge arrestor equipment using current FY25 maintenance budget. (October – December 2024)
- Replacement of the 5 oldest traffic signal cabinets and adding battery backups to these locations using FY25 budget. (December 2024)
- Developing a plan to add battery backups to the 20 other signal locations for FY26 budget consideration

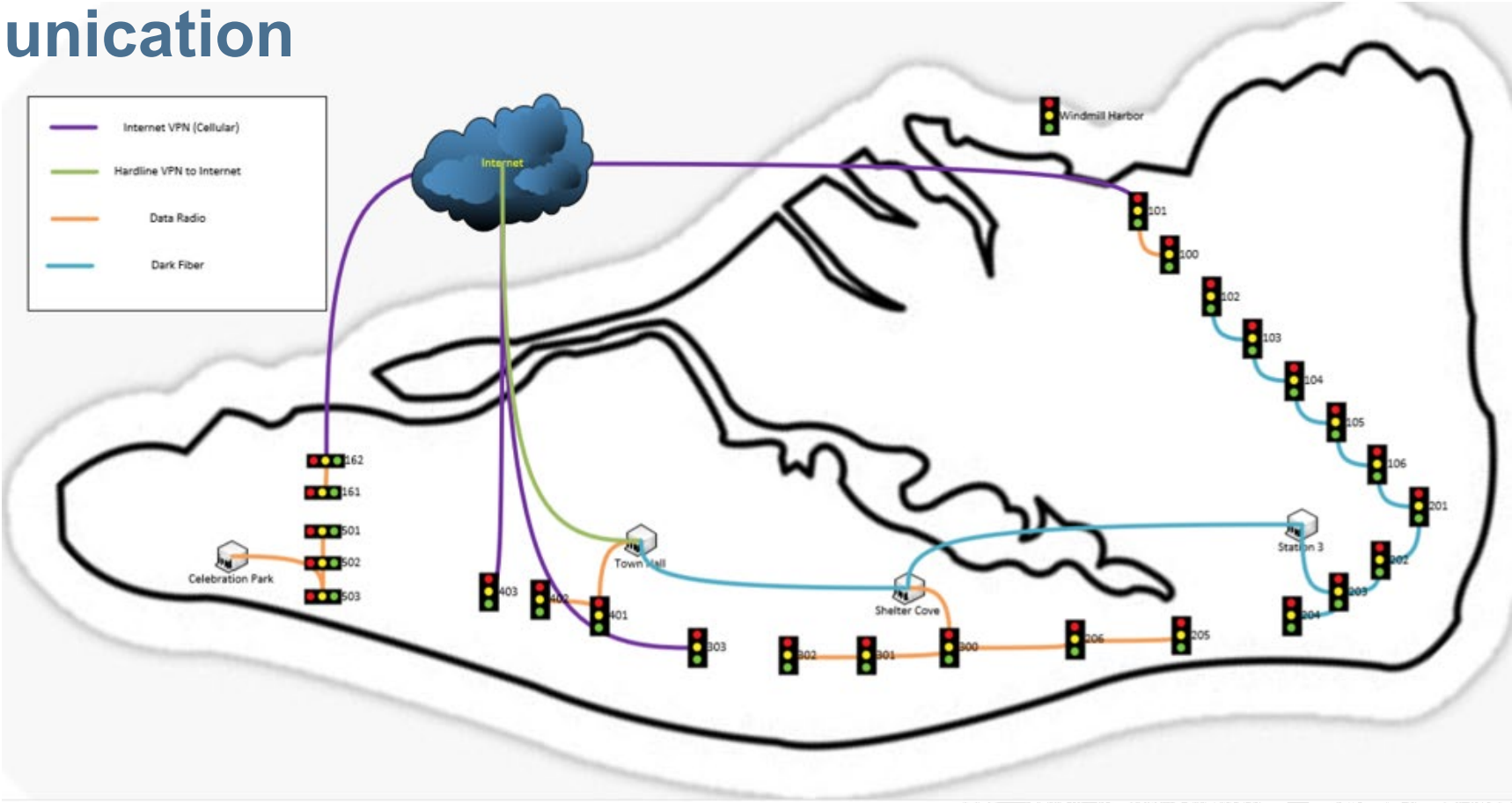
Fiber Optics Communication

Provides more reliable consistent communication with less disruptions

- Fiber lines offer redundancy over radio and cellular communication
- Fiber lines offer a consistent signal
- Fiber lines would reduce maintenance currently required by our radio communication system in terms of line-of-sight tree trimming

Fiber Optics Communication

- IT department has evaluated the fiber costs to service the signals system
- Estimated Cost to rent dedicated fiber line space from Sparklight (Hargray) is $30,000 per year and would take approximately 6 months to implement
- Town staff is advancing this effort to connect to fiber



Windmill Harbor Signal

- Letter sent to Beaufort County on June 24, 2024, requesting the signal be transferred to Town ownership for inclusion in the Town's traffic signal inventory and ATSM network

- The letter also requested that Beaufort County fund the capital improvements necessary to upgrade the signal to be compatible with the ATSM network. (Estimated costs +/- $70,000)

Contacting Town with Traffic Signal Concerns

MyHHI Mobile App

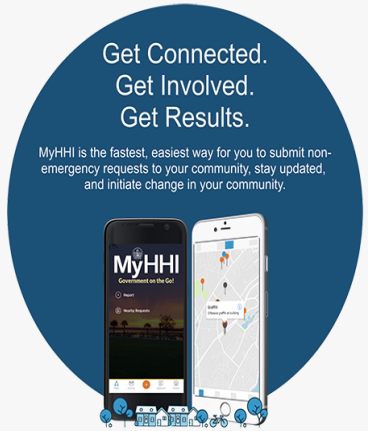
Your Government on the Go!

Our mobile app is designed to be user-friendly and provide important Town services and information in the palm of your hand.

- ✓ Simple Reporting
- ✓ News & Announcements
- ✓ Meet Your Town Council
- ✓ Our Beach
- ✓ Parks and Pathways
- ✓ CultureHHI
- ✓ Ready HHI

The MyHHI app is available for free on Google Play or the App Store.

Download on the App Store | GET IT ON Google Play



Report an Issue

Now you can report non-emergency issues to the Town from your smartphone, tablet, or computer, thanks to our partnership with SeeClickFix. Use our online service to report issues for:

- Beach Maintenance Requests
- Park Maintenance Requests
- Pathway / Sidewalk Issues
- Dead Animal
- Beach Violations
- Drainage Concerns
- Landscape Issues
- Tree Issues
- Traffic Signal Issues
- Pothole / Pavement Issues
- Trash / Debris / Litter
- Sign Issues
- Graffiti / Vandalism

You have the option to upload a photo with each service request, as a visual reference to help communicate the need to staff. Customer service requests are routed to town staff to help answer questions and provide solutions.

Project Contact

Jim Iwanicki
Transportation Program Manager

1 Town Center Court
Hilton Head Island, SC 29928

843-341-4774

JimI@hiltonheadislandsc.gov

Traffic Signal Hotline

843-715-8188

Report Issues

Questions?