

Intelligent Transportation Systems (ITS)

February 2010



ITS: Using technology to improve traffic flow, safety, air quality and fuel efficiency when moving people and goods

ITS Applications:



Arterial Management



Freeway Management



Crash Prevention & Safety



Road Weather Management



Roadway Operations & Maintenance



Transit Management



Traffic Incident Management



Emergency Management



Electronic Payment & Pricing



Traveler Information



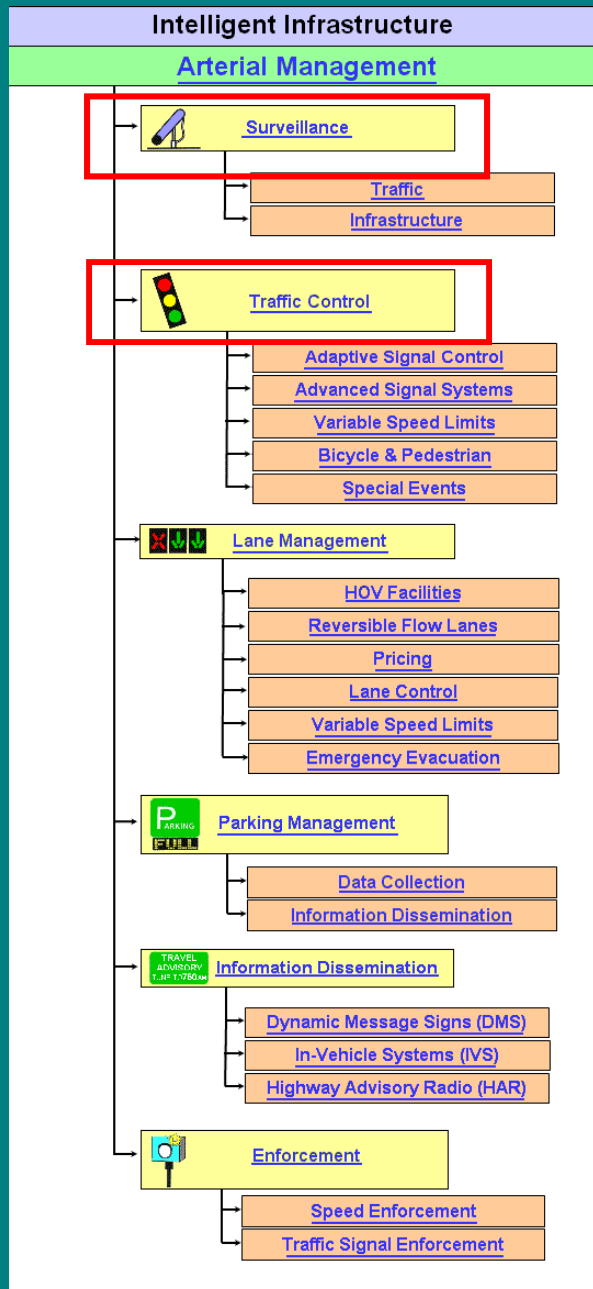
Information Management



Commercial Vehicle Operations



Intermodal Freight



Traffic surveillance component used to recognize incidents and respond through manual traffic control signal coordination adjustments

Brevard County's main focus is on Traffic Control component of Arterial Management

Computer-aided signal coordination to optimize travel speed

Benefits:

- Smoother, predictable traffic flow
- Reduced lost time from delay and stops
- Reduced fuel consumption
- Reduced chance of rear-end crashes
- Improved traffic flow during evacuations
- Improved response to congestion from emergencies
- Improved air quality
- Reduced road rage

ITS Infrastructure

- Fiber optic cable
- Video Detectors
- ITS-capable Traffic Signal Controllers
- Software/Programming
- Control Center
- Operation and Maintenance

Fiber Optic Network

Detectors

Controller Box

Control Center



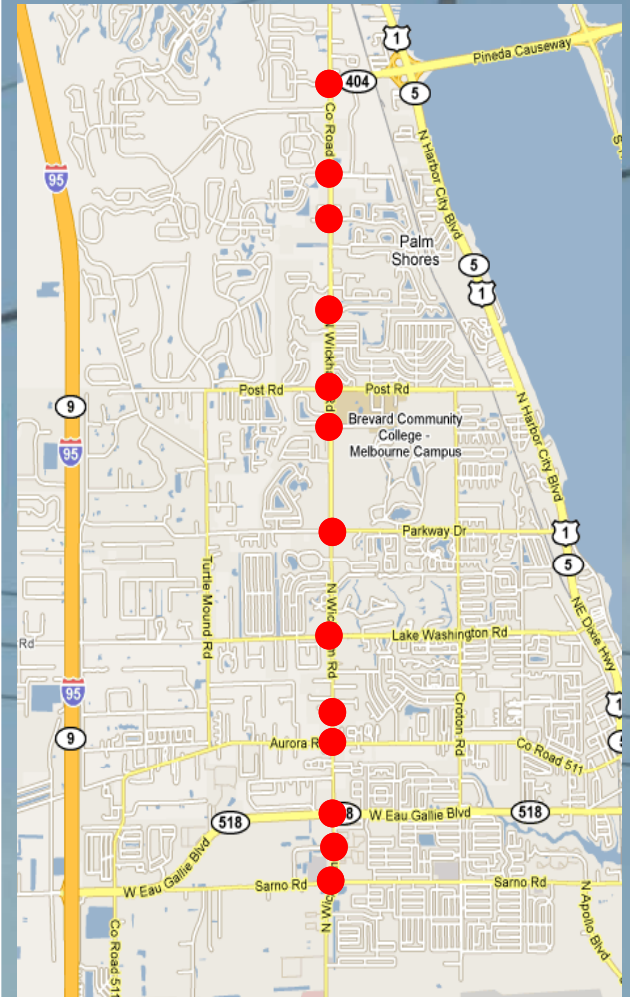
ITS Control Center

- Software/Programming Detection
- Counts volume and turning movements



ITS: Wickham Rd

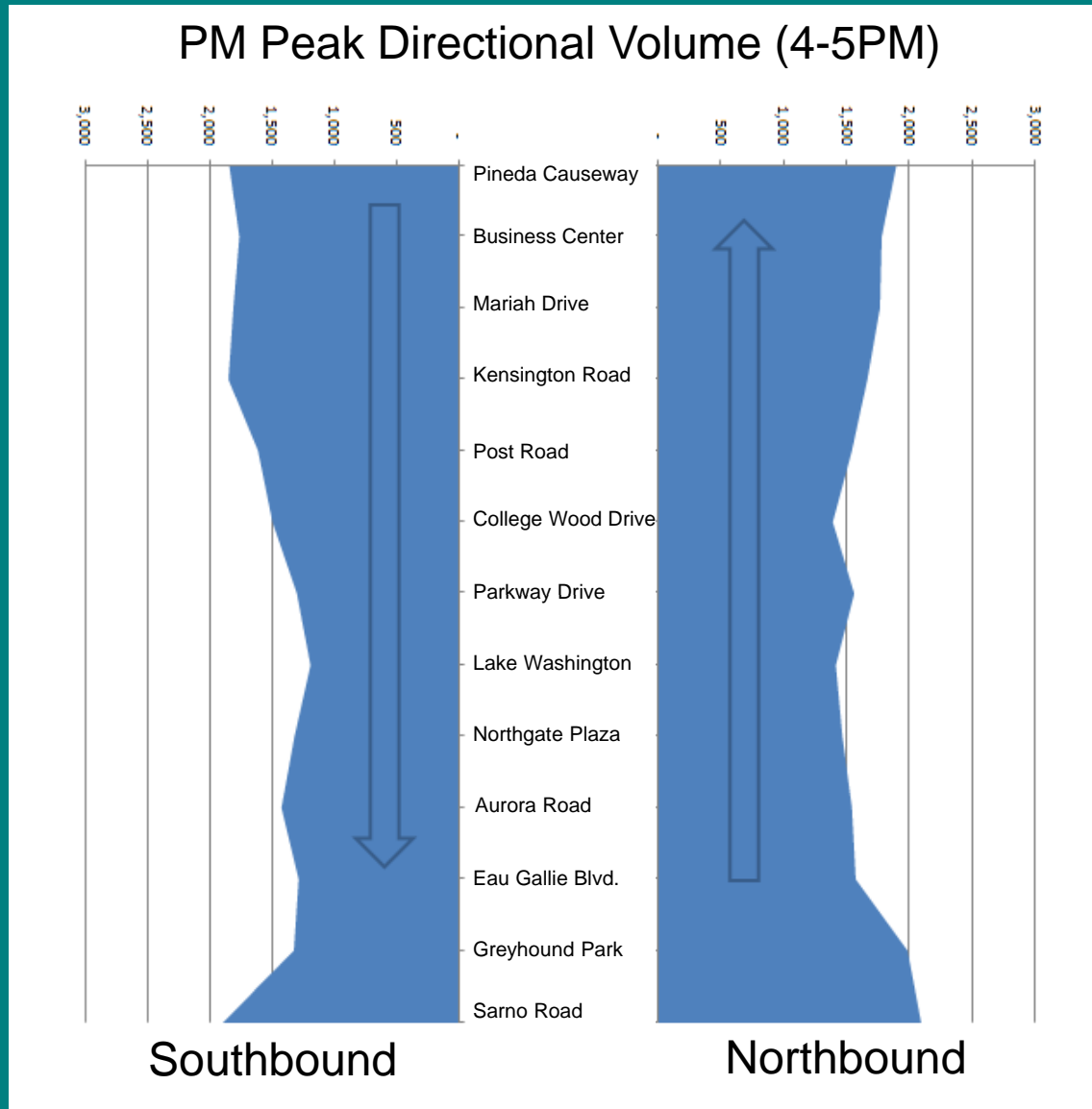
- Some fiber cable available
- High traffic volume (>35,000 vehicles per day)
- High signal density (13 signals in 5.2 mi. between Sarno and Pineda)
- Relatively low cost (\$1.5M)
- Funding from FDOT grants, Melb. and Brevard County



ITS: Wickham Rd. Before And After Analysis

- Study conducted in 2008
- AM, Mid-day and PM periods evaluated. Only PM reported here.
- Performance Indicators:
 - Directional Volume
 - Travel Time
 - Number of Stops
 - Fuel Consumption

Wickham Road: Directional Volume

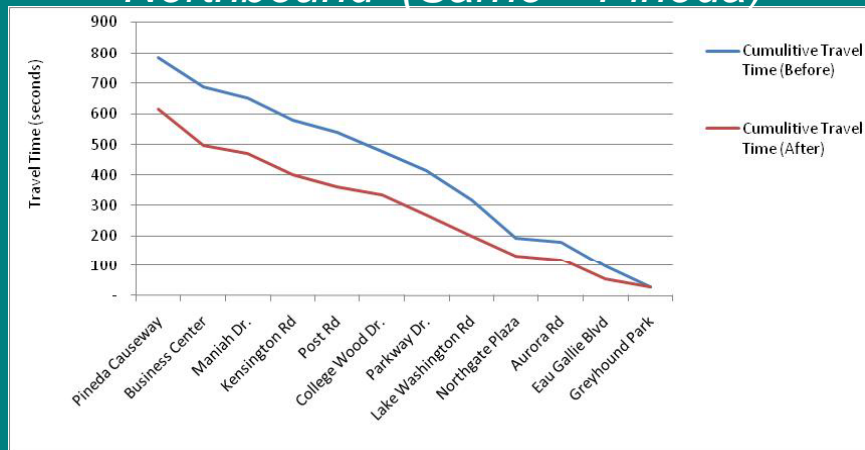


- PM Peak Hour volume ranges from 2,800 vph at Lake Washington to 4,000 vph at Sarno
- PM Peak is directionally balanced for majority of corridor
- More difficult to coordinate signals when directional volume is balanced. Can't favor one direction.
- Daily volume between about 30,000 and 42,000.

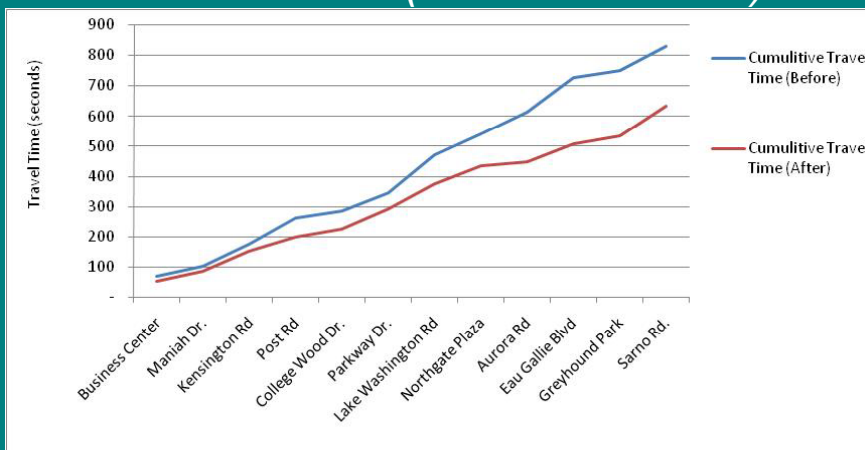
Wickham Road: Travel Time

PM Travel Time

Northbound (Sarno – Pineda)



Southbound (Pineda – Sarno)

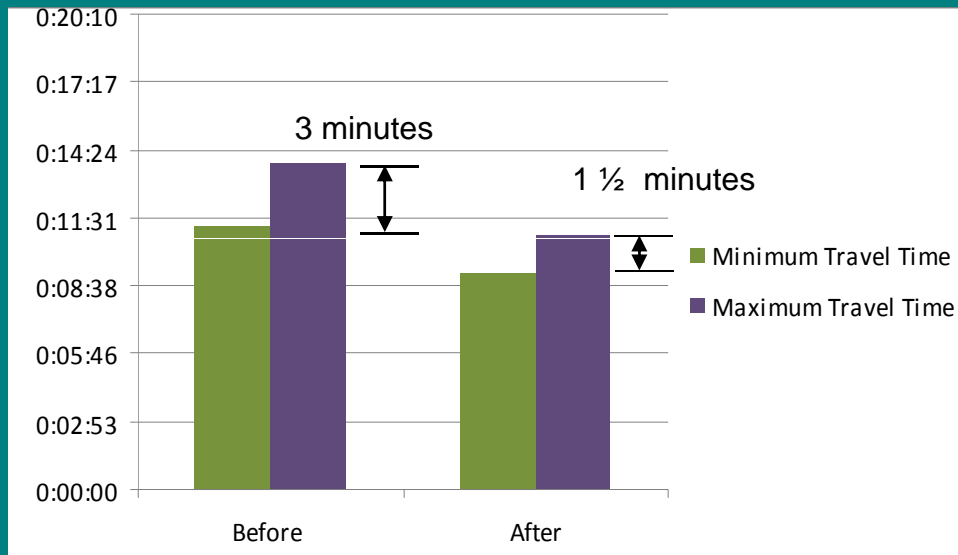


Travel Time Comparison (PM Peak)

	Before (Blue line)	After (Red Line)	Savings Per Trip
NB	13:06 min.	10:17 min.	2:49 min.
SB	13:48 min.	10:34 min.	3:14 min.

Wickham Road: Travel Time

Cumulative Travel Time Variance

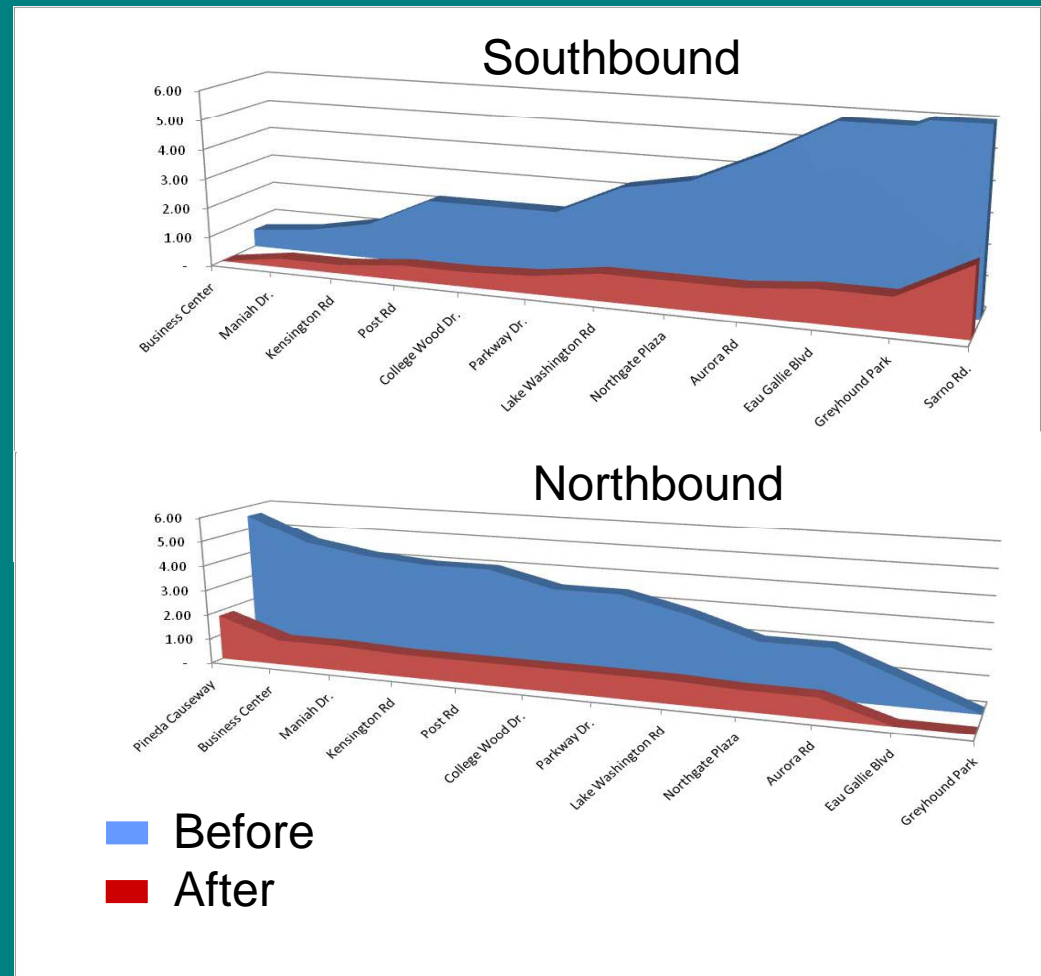


- Average Trip before ITS took 11 to 14 minutes
- Average Trip after ITS now takes 9 to 10 1/2 minutes
- Travel time variability reduced by almost half
- Less travel time variance reflects better efficiency
- Travel time is more predictable, an important concern to users

Wickham Road: Stops

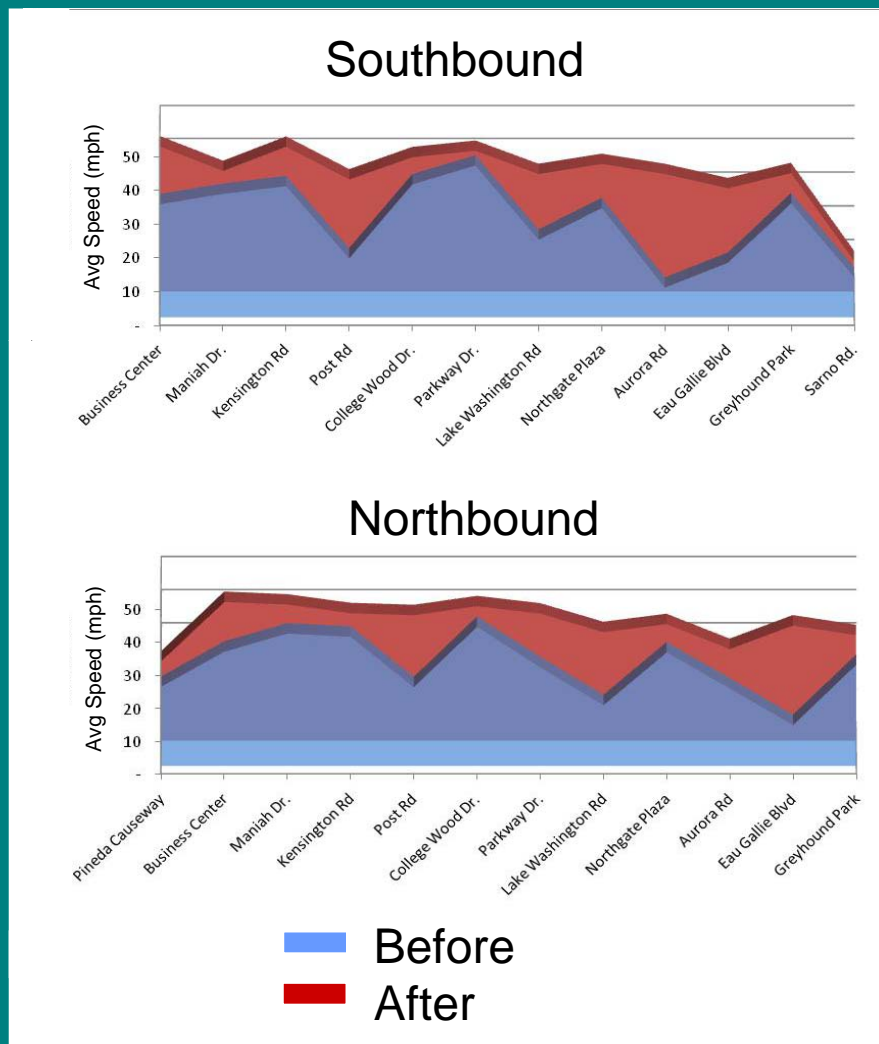
PM Peak Hour Cumulative Number of Stops

- Before ITS – Average 5 stops
- After ITS – Average 2 stops



Wickham Road: Speed

PM Peak Hour Average Speed



- **Average Speed** is a good indicator of overall corridor performance
- **AFTER ITS --**
 - Travel speed is more consistent over longer distances
 - Low speed likely due to geometric deficiencies at intersections
 - Post, Lake Washington, Aurora, Eau Gallie, Sarno would benefit from dual lefts and dedicated right turn lanes

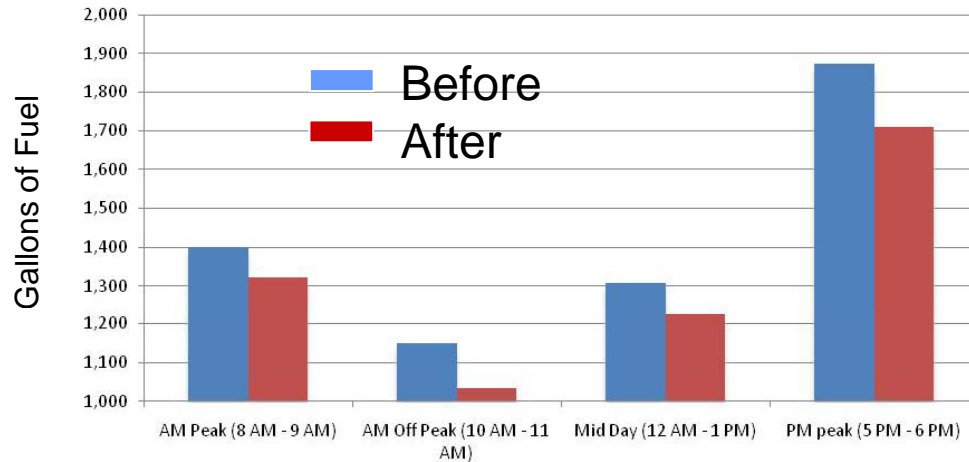
Wickham Road: Fuel Consumption

- ITS reduces delay and decreases travel time, resulting in less fuel consumption
- Fuel consumption decreased 9% during the PM peak period

Estimated annual fuel savings per vehicle:

21 Gallons Per Year

Total Fuel Consumed Per Period by all Vehicles



ITS Pilot Project : Wickham Rd

The average Wickham Road commuter:



Saves 20 minutes travel time each week. 17 hours per year.

Makes 26 fewer stops per week. 1350 fewer annual chances at a rear-end collision.

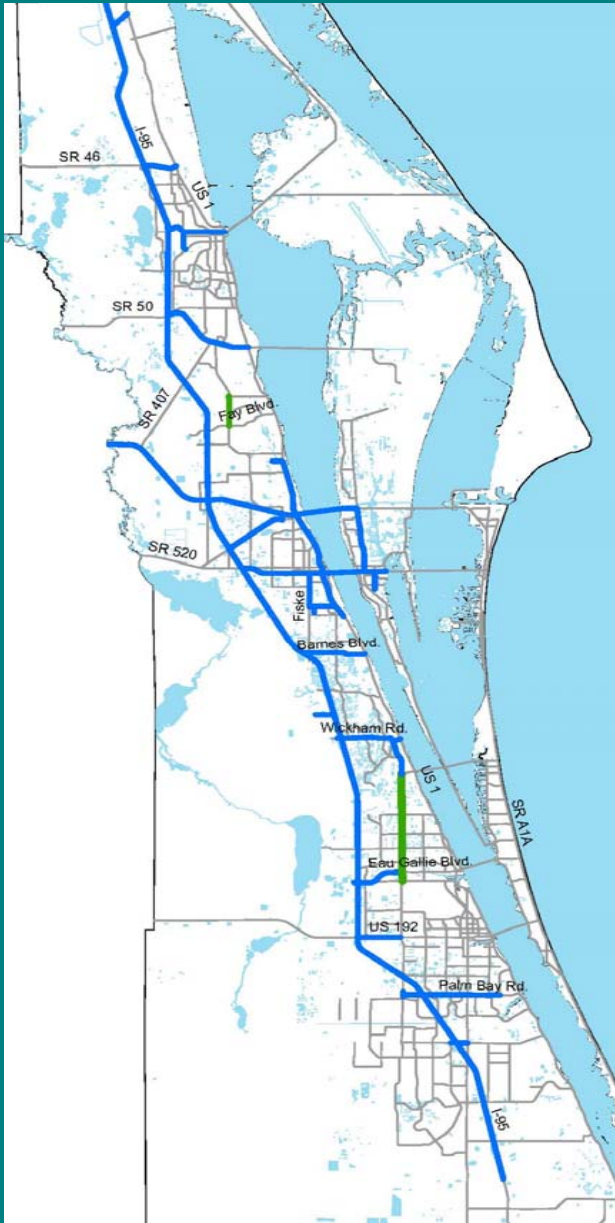
Saves about \$1.34 in fuel cost per week and \$70 annually (at \$3.33/gallon).



Saves in fuel costs each year more than twice the average annual Local Option Gas Tax collected per vehicle (\$28.00).



ITS: Current Fiber Optic Network



Fiber optic cable installation is a major cost of ITS. Substantial savings by using existing fiber.

In mid-2000s, FDOT installed fiber optic cable along I-95 and key east-west roads to US 1.

Both FDOT and Brevard County share fiber optic network cabling for traffic management purposes.

All major FDOT and County construction projects now include fiber cable and ITS signals (Palm Bay Rd and US 1 widening).

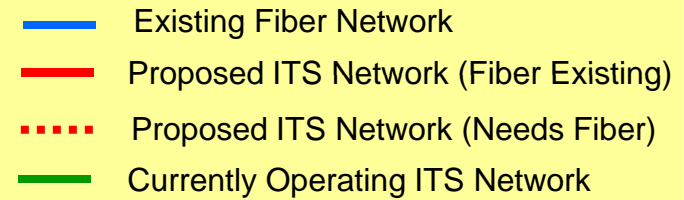
County's approach builds upon FDOT backbone by connecting signals to existing fiber and adding fiber where necessary.

Map shows current fiber optic locations usable for ITS.

ITS: Potential Deployment



- Fully deployed ITS may look like this:

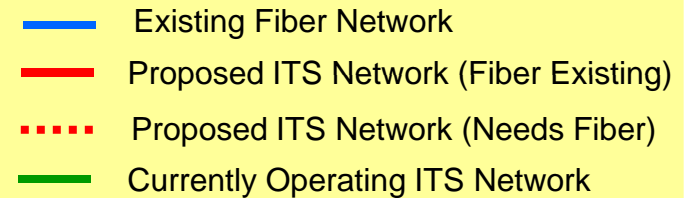


- Also need to consider
 - signal density
 - traffic volume
 - congestion levels
 - funding partnerships
 - operator staffing limitations
- More fiber cable now in place in northern half of county than in south
- No fiber installed beachside

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ITS: Next Steps

- County will continue to seek opportunities for high benefit --low cost ITS improvements
- TPO should prioritize the projects for funding from its Traffic Operations set-aside box
 - 5% of XU funds annually reserved for traffic operations
 - About \$450,000 annually
 - Reserve of \$1.6M
- County and TPO will consult with FDOT and cities. Use project list previously submitted by cities.
- Recommendations will consider estimated cost, benefit, potential funding sources/partnerships, maintenance and operations.
- Present recommended priorities at March TPO meeting.