EVANS GEORGIA
WASHINGTON ROAD CORRIDOR

VALIDATION STUDY BRIEF

STUDY SUMMARY
In early 2010, Columbia County studied five InSync-equipped intersections on the North Sector of Washington Road. In late 2011, the county studied InSync as deployed on an additional seven intersections in the South Sector, creating a continuous network of 12 InSync intersections encompassing 4.8 miles. This two-phase study compares each sector of Washington Road's traffic operations under its previous coordinated timing plan with its operations using InSync adaptive traffic control.

OBJECTIVES
Reduce stops, travel time, delay and fuel consumption in the network by optimizing traffic signal operations using InSync.

CHALLENGES
The North Sector of Washington Road intersects with another arterial, N. Belair Road, making signal optimization along the two arterials particularly challenging. Both sectors experience high volume on the side streets, heavy AM/PM peak commuter traffic, variable traffic patterns and flow generated by many large businesses along the corridor and major event traffic that the previous coordinated timing plan was unable to properly serve.

SOLUTION
Columbia County selected InSync adaptive traffic control to meet its objectives. The system was subsequently upgraded from InSync, which only uses video detection, to InSync:Fusion, which also integrates inductive loops. Rhythm Engineering helped configure the system, monitored its performance and made adjustments as needed to optimize traffic flow.

BENEFITS
The benefits to the community summarized below are based on the results of InSync on 12 intersections along Washington Road. All calculations are based on normal weekday travel and the results indicate approximate benefits to drivers. Because Columbia County operates additional InSync intersections not studied here, benefits are likely greater.

The initial five intersections on the North Sector of Washington Road were analyzed for safety results. Crashes reduced by 26% from 2009, the year before InSync was deployed, to 2010, the first year InSync was operational. This result is the summation of a 14.6% reduction in mid-block and driveway collisions and a 30.7% decrease in intersection collisions. Overall, there were 42 fewer crashes on this segment alone. Using an average cost of $27,731 per crash, this provides an additional economic benefit of $1,164,702 per year as well as a likely decrease in injuries and potentially fatalities.

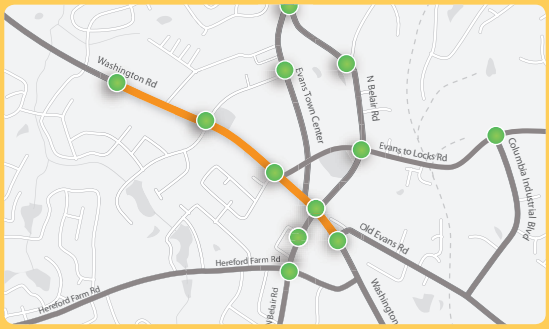
> It was amazing to see the transformation in the road in mere minutes after the system was turned on. In the past five years, I have driven this corridor several times a day. I can clearly remember only making it through the corridor, without stopping, one time in those five years. We were able to do it three times in a row within 30 minutes of activating the system.
>
> **Matt Schlachter, P.E.**
> Director
> Construction & Maintenance Services Division
> Columbia County

	DAILY BENEFIT	ANNUAL BENEFIT
Vehicle Hours of Travel (reduction)	895 hours	232,764 hours
Fuel Consumption (decrease)	671 gallons	174,403 gallons
Stops (eliminated)	75,362 stops	1,959,099 stops
Total Economic Benefit (fuel * $2.50) + (stops * $.10) + (time * $15.00)	**$23,313**	**$6,061,270**

Project Manager: Glen Bollinger
Traffic Engineer
Columbia County, Georgia
706.868.3356
gbollinger@columbiacountyga.gov

NORTH SECTOR

InSync:Fusion with video detection and inductive loops.



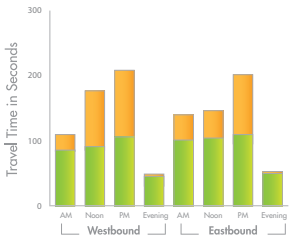
MOST NOTEWORTHY IMPROVEMENTS:

- 52% travel time reduction
- 100% stop reduction
- 110% average speed increase
- 93% delay reduction
- 43% hydrocarbon emission reduction
- 33% fuel reduction

The study results below evaluate and compare the travel time, number of stops, speed, delay, emissions and fuel consumption before implementation of InSync and after implementation of InSync:Fusion.

NORTH SECTOR WITH INSYNC:FUSION MAP & RESULTS

Travel Time Reductions



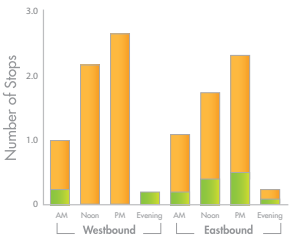
Eastbound

AM Peak	29.8 secs	23% reduction
Noon	59.8 secs	37% reduction
PM Peak	104.2 secs	49% reduction
Evening	1.0 secs	1% reduction

Westbound

AM Peak	23.2 secs	21% reduction
Noon	92.2 secs	50% reduction
PM Peak	115.6 secs	52% reduction
Evening	2.0 secs	2% reduction

Stop Reductions



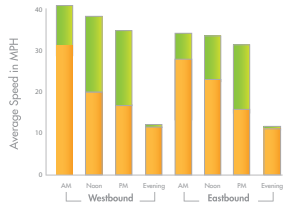
Eastbound

AM Peak	1.0 stops	83% reduction
Noon	1.2 stops	67% reduction
PM Peak	1.6 stops	67% reduction
Evening	0.6 stops	75% reduction

Westbound

AM Peak	0.8 stops	80% reduction
Noon	2.2 stops	100% reduction
PM Peak	2.8 stops	100% reduction
Evening	0.0 stops	0% reduction

Average Speed Increase



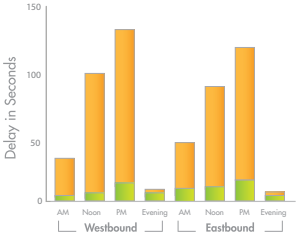
Eastbound

AM Peak	8.1 mph	29% increase
Noon	13 mph	58% increase
PM Peak	16.0 mph	95% increase
Evening	0.3 mph	1% increase

Westbound

AM Peak	11.1 mph	36% increase
Noon	19.9 mph	100% increase
PM Peak	18.3 mph	110% increase
Evening	0.6 mph	2% increase

Delay Reductions



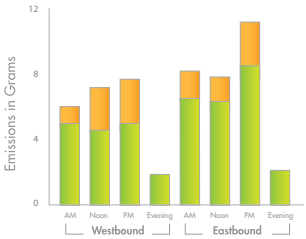
Eastbound

AM Peak	36.6 secs	73% reduction
Noon	67.0 secs	83% reduction
PM Peak	111.6 secs	83% reduction
Evening	8.4 secs	31% reduction

Westbound

AM Peak	31.8 secs	91% reduction
Noon	94.8 secs	93% reduction
PM Peak	123.0 secs	89% reduction
Evening	8.8 secs	32% reduction

Hydrocarbon Emission Reductions



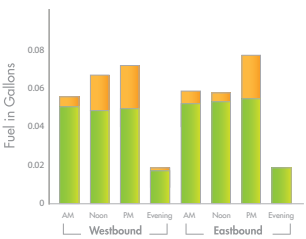
Eastbound

AM Peak	1.39 grams	20% reduction
Noon	0.98 grams	15% reduction
PM Peak	2.82 grams	33% reduction
Evening	-0.25 grams	-5% reduction

Westbound

AM Peak	1.17 grams	20% reduction
Noon	3.18 grams	43% reduction
PM Peak	3.18 grams	41% reduction
Evening	-0.16 grams	-3% reduction

Fuel Reductions



Eastbound

AM Peak	0.01 gallons	14% reduction
Noon	0.01 gallons	11% reduction
PM Peak	0.02 gallons	27% reduction
Evening	0.0 gallons	0% reduction

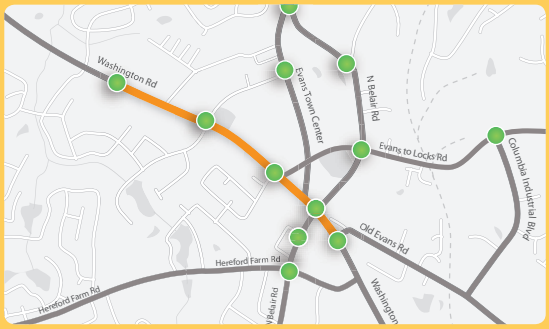
Westbound

AM Peak	0.0 gallons	8% reduction
Noon	0.02 gallons	28% reduction
PM Peak	0.02 gallons	33% reduction
Evening	0.0 gallons	2% reduction

Before After

NORTH SECTOR

InSync with only video detection.



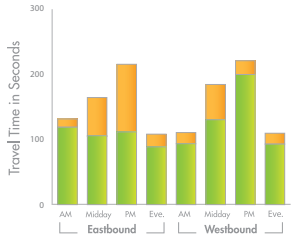
MOST NOTEWORTHY IMPROVEMENTS:

- 48% travel time reduction
- 100% stop reduction
- 93% average speed increase
- 78% delay reduction
- 39% hydrocarbon emission reduction
- 32% fuel reduction

The study results below evaluate and compare the travel time, number of stops, speed, delay, emissions and fuel consumption before implementation of InSync and after implementation of InSync equipped with only InSync's video detection.

NORTH SECTOR WITH INSYNC AND VIDEO MAP & RESULTS

Travel Time Reductions



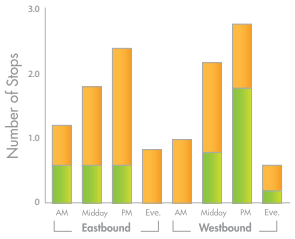
Eastbound

AM Peak	12.6 secs	10% reduction
Midday	57.0 secs	35% reduction
PM Peak	103.2 secs	48% reduction
Evening	19.4 secs	18% reduction

Westbound

AM Peak	17.0 secs	15% reduction
Midday	53.8 secs	29% reduction
PM Peak	21.0 secs	10% reduction
Evening	16.6 secs	15% reduction

Stop Reductions



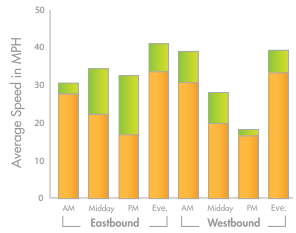
Eastbound

AM Peak	0.6 stops	50% reduction
Midday	1.2 stops	67% reduction
PM Peak	1.8 stops	75% reduction
Evening	0.8 stops	100% reduction

Westbound

AM Peak	1.0 stops	100% reduction
Midday	1.4 stops	64% reduction
PM Peak	1.0 stops	36% reduction
Evening	0.4 stops	67% reduction

Average Speed Increase



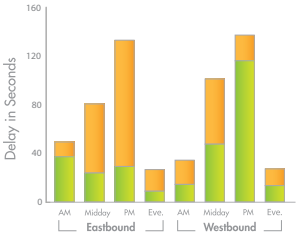
Eastbound

AM Peak	2.9 mph	10% increase
Midday	12.1 mph	54% increase
PM Peak	15.7 mph	93% increase
Evening	7.4 mph	22% increase

Westbound

AM Peak	8.3 mph	27% increase
Midday	8.2 mph	41% increase
PM Peak	1.7 mph	10% increase
Evening	6.0 mph	18% increase

Delay Reductions



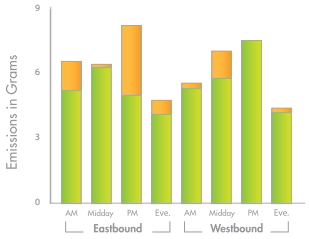
Eastbound

AM Peak	12.2 secs	24% reduction
Midday	57.0 secs	70% reduction
PM Peak	104.2 secs	78% reduction
Evening	17.8 secs	66% reduction

Westbound

AM Peak	20.0 secs	57% reduction
Midday	53.8 secs	53% reduction
PM Peak	21.2 secs	15% reduction
Evening	13.8 secs	50% reduction

Hydrocarbon Emission Reductions



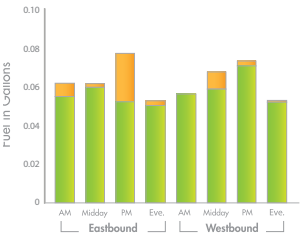
Eastbound

AM Peak	1.4 grams	20% reduction
Midday	0.2 grams	2% reduction
PM Peak	3.3 grams	39% reduction
Evening	0.7 grams	14% reduction

Westbound

AM Peak	0.3 grams	5% reduction
Midday	1.3 grams	18% reduction
PM Peak	-0.1 grams	-1% reduction
Evening	0.2 grams	5% reduction

Fuel Reductions



Eastbound

AM Peak	0.01 gallons	11% reduction
Midday	0.00 gallons	3% reduction
PM Peak	0.02 gallons	32% reduction
Evening	0.00 gallons	5% reduction

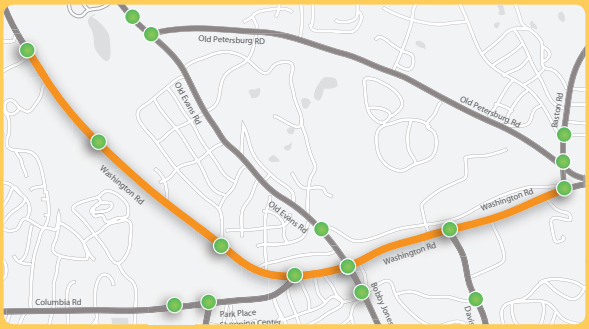
Westbound

AM Peak	0.00 gallons	-1% reduction
Midday	0.01 gallons	13% reduction
PM Peak	0.00 gallons	3% reduction
Evening	0.00 gallons	2% reduction

Before After

SOUTH SECTOR

InSync:Fusion with video detection and inductive loops.



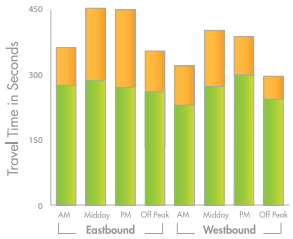
MOST NOTEWORTHY IMPROVEMENTS:

- 39% travel time reduction
- 90% stop reduction
- 65% average speed increase
- 82% delay reduction
- 29% hydrocarbon emission reduction
- 20% fuel reduction

The study evaluates and compares the travel time, number of stops, speed, delay, emissions and fuel consumption before and after the implementation of the InSync:Fusion system.

SOUTH SECTOR MAP & RESULTS

Travel Time Reductions



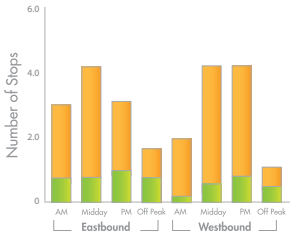
Eastbound

AM Peak	83.8 secs	23% reduction
Midday	169.1 secs	37% reduction
PM Peak	176.4 secs	39% reduction
Off Peak	79.5 secs	23% reduction

Westbound

AM Peak	60.8 secs	19% reduction
Midday	136.4 secs	33% reduction
PM Peak	108.9 secs	27% reduction
Off Peak	35 secs	12% reduction

Stop Reductions



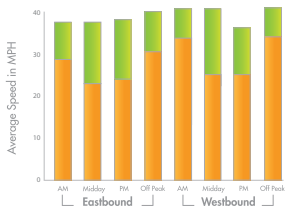
Eastbound

AM Peak	2.4 stops	80% reduction
Midday	3.7 stops	86% reduction
PM Peak	2.5 stops	76% reduction
Off Peak	1.2 stops	67% reduction

Westbound

AM Peak	1.8 stops	90% reduction
Midday	3.5 stops	81% reduction
PM Peak	3.3 stops	77% reduction
Off Peak	0.4 stops	40% reduction

Average Speed Increase



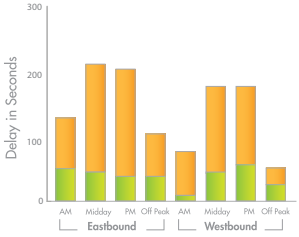
Eastbound

AM Peak	8.9 mph	30% increase
Midday	14.3 mph	60% increase
PM Peak	15.6 mph	65% increase
Off Peak	9.1 mph	29% increase

Westbound

AM Peak	8.2 mph	24% increase
Midday	12.9 mph	49% increase
PM Peak	9.8 mph	37% increase
Off Peak	5.1 mph	14% increase

Delay Reductions



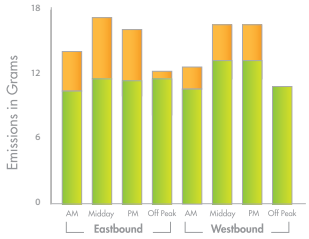
Eastbound

AM Peak	83.4 secs	62% reduction
Midday	163.4 secs	78% reduction
PM Peak	171.6 secs	82% reduction
Off Peak	70.5 secs	64% reduction

Westbound

AM Peak	68.8 secs	79% reduction
Midday	130.9 secs	76% reduction
PM Peak	108.7 secs	64% reduction
Off Peak	28 secs	48% reduction

Hydrocarbon Emission Reductions



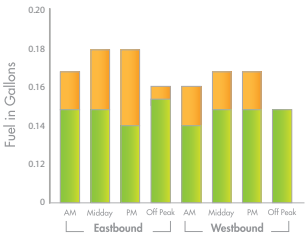
Eastbound

AM Peak	3.6 grams	25% reduction
Midday	5.3 grams	31% reduction
PM Peak	4.8 grams	29% reduction
Off Peak	1.2 grams	9% reduction

Westbound

AM Peak	3.5 grams	27% reduction
Midday	2.9 grams	19% reduction
PM Peak	3.1 grams	20% reduction
Off Peak	-0.3 grams	-3% reduction

Fuel Reductions



Eastbound

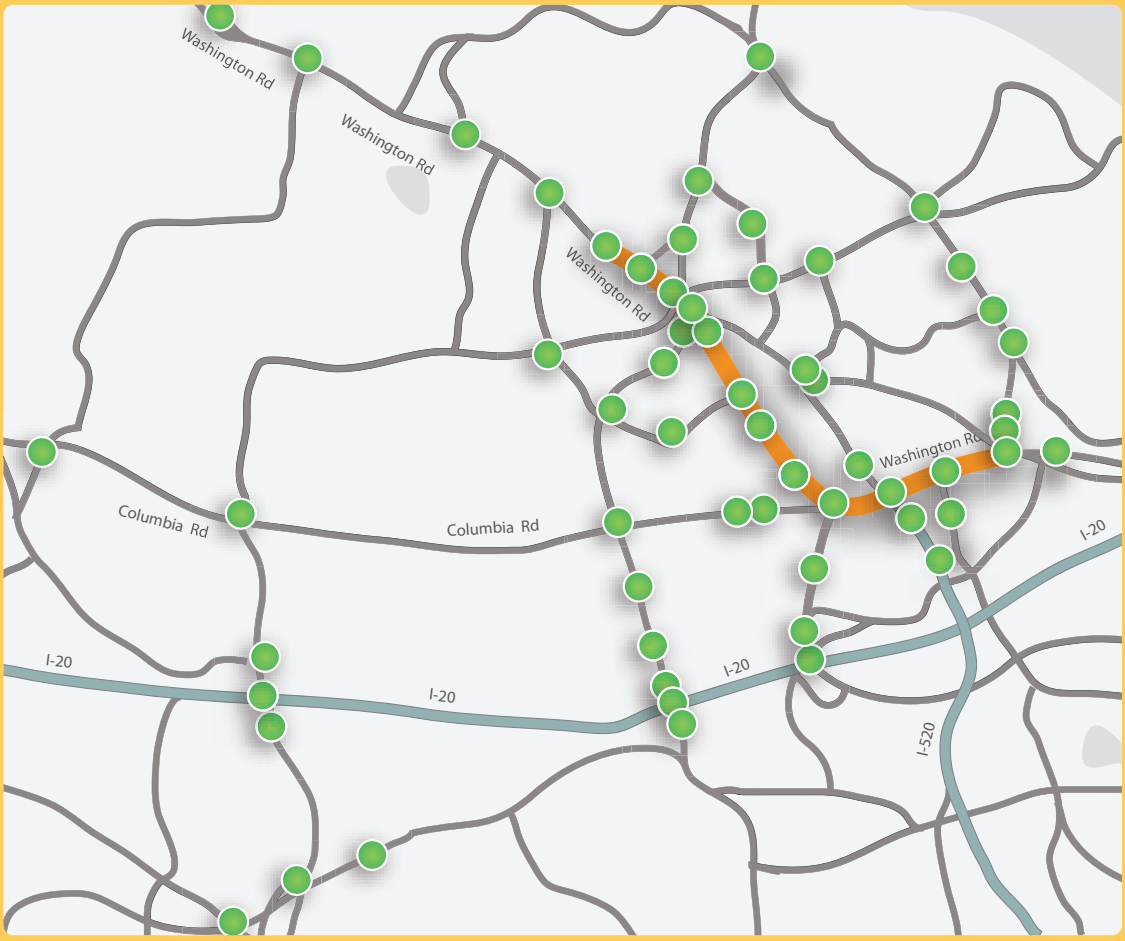
AM Peak	0.02 gallons	14% reduction
Midday	0.04 gallons	19% reduction
PM Peak	0.04 gallons	20% reduction
Off Peak	0.00 gallons	2% reduction

Westbound

AM Peak	0.02 gallons	15% reduction
Midday	0.02 gallons	13% reduction
PM Peak	0.02 gallons	14% reduction
Off Peak	0.00 gallons	-1% reduction

Before After

 Data for all corridors collected by Columbia County Staff, 2010 - 2012



The green markers indicate the intersections where InSync is deployed. The Washington Road corridor is highlighted in orange.

STUDY DATA COLLECTION

Agency representatives collected before-and-after field data. North Sector "before" data was collected in January 2010 with InSync "after" data collected in February 2010 and InSync:Fusion data collected in September 2010. South Sector "before" data was collected in August 2011 with "after" data collected in January 2012.

The studies of both sectors were conducted during normal weekday travel conditions to ensure similar travel patterns between studies. This corridor has >40,000 ADT (average daily traffic). Travel time runs were conducted through each sector of the corridor in both directions during multiple time-of-day periods (AM peak, noon peak, PM peak, and evening) on Tuesday, Wednesday, and Thursday.

The drivers conducting the travel time used the "floating car method," in which the drivers attempt to travel with the flow of traffic, changing lanes so as to pass as many cars as pass them. This method is used so that the travel times collected are representative of the travel time of the average vehicle traveling through the corridor. Data were gathered by driving the corridor using GPS equipment and software, collecting data, then processing the data using PC-Travel software.

> The overall quality of performance and level of satisfaction we have with Rhythm Engineering's support and operations led us to make the decision to incorporate InSync on every traffic signal within Columbia County.
>
> **Glen Bollinger**
> Traffic Engineer
> Columbia County